WILDLIFE REVIEW

NUMBER 83 DECEMBER 1955

UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

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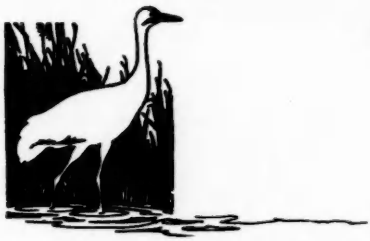

WILDLIFE REVIEW

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United States Department of the Interior

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Except as indicated, abstracts are by William H. Stickel, editor

WILDLIFE--NEW GAME SERIES

MICHIGAN WILDLIFE. Published at irregular intervals, probably 4 to 6 times a year, by Dept. of Wildlife Management, School of Natural Resources, U. of Michigan, Ann Arbor. No. 1, 2 p., illus., Sept. 1955. No. 2, 6 p., Nov. 1955.
According to Dr. Warren W. Chase, this series of leaflets is designed to make available valuable research material that might be lost in graduate theses. In format, issues suggest research notes of forest experiment stations. Pages are 8.5 x 11 in. and are punched for insertion in loose-leaf holders. Their 2 columns of small print carry a lot of information and are finely reproduced by offset on excellent paper. No. 1 gives data on production of deer browse on cutover aspen land (see p. 36 this issue of WR) and no. 2 is an annotated bibliography of parasites and diseases of beaver (see p. 27).

WILDLIFE--BIBLIOGRAPHY, BIOGRAPHY, HISTORY

Anonymous. LIST OF FISH AND WILDLIFE SERVICE INFORMATIONAL LEAFLETS ON WILDLIFE. US F&WS, Wildl. Leafl. 369. 2 p. Oct. 1955.
Lists available Wildlife Leaflets, with breakdown by subject.

Anonymous. LIST OF FISH AND WILDLIFE SERVICE PRINTED PUBLICATIONS ON WILDLIFE. US F&WS, Wildl. Leafl. 370. 2 p. Oct. 1955.
Lists available publications, and their prices if any, in the following series: Refuge Leaflets, Conservation in Action, Wildlife Circulars, Wildlife Research Bulletins, Research Reports, Conservation Bulletins, Circulars, Regulatory Announcements, Annual Reports. Some of these series are unfamiliar because no publications have appeared in them in recent years.

Mansueti, Romeo. MARYLAND NATURAL RESOURCE BIBLIOGRAPHY / A GUIDE TO KEY WORKS DEALING WITH THE ZOOLOGY, BOTANY, GEOLOGY AND RELATED SUBJECTS. Md. Dept. Res. & Ed., Solomons, Md., Resource Study Rep. no. 7. 1-27 p. Apr. 1955.
1003 titles are listed under 37 subject headings. There is also an index.

WILDLIFE--EDUCATION

Dawson, Everett T. (Texas Game Comm.) TEXAS WILDLIFE. Banks Upshaw & Co., Dallas. 175 p., illus. 1955. $3.20. [From review in J. Soil & Water Cons. 10(6).]
Book on natural history and conservation of native animals; written at sixth grade level as a supplemental reader for schools. "The lucid and interesting material will appeal to any reader, of whatever age."

Fleming, Rose E. (Miss. Game Comm.) THE SOUTH IS WORKING ON ITS PROBLEMS. Trans. 20th N. A. Wildl. Conf. p. 633-640. 1955.
Tells what the South is doing and about the progress it is making in conservation education. The trend is toward more unified approaches and more interagency cooperation.

Gregg, Frank. (Colo. Dept. Game.) WHAT'S WRONG WITH STATE CONSERVATION MAGAZINES? Trans. 20th N. A. Wildl. Conf. p. 616-624. 1955.
Four common shortcomings hamper the effectiveness of state conservation magazines. Conclusions are based on study of one volume each of 40 different magazines. 1. Perversion of purpose -- Many publications persist in confusing resource management and the people who do the managing; that is, they tend to publicize officials rather than conservation needs. Others make such obvious errors as holding up the publishing agency as infallible, devoting too much space to how-to-harvest articles, or avoiding coverage of controversial issues. 2. Distribution -- It seems wiser to publish a detailed, attractive magazine and sell it to community leaders, rather than to publish a less effective journal and to distribute it gratis and helter-skelter. 3. Untrained staffs -- Editors with biological backgrounds should develop skill in communications. Editors with little biological background should learn the fundamentals of resource management. 4. Administrators -- Many fail to demand high publication standards. A few still use state magazines for care of political fences.--Frank Gregg.

WILDLIFE--EDUCATION--Continued

Harlan, James R. (Iowa Cons. Comm.) LET'S USE TELEVISION. Trans. 20th N. A. Wildl. Conf. p. 609-615. 1955.
Discusses the use of television in conservation-education departments. Material presented is designed from actual work in the Iowa Cons. Dept. A brief analysis is given of studio production and how subject matter for shows is selected. An outline is given of equipment, production and personnel costs needed to set up television operations along the Iowa plan. Tables are included for easy calculation.--J. R. Harlan.

Huber, William W. (US For. Serv., Portland, Ore.) CONSERVATION EDUCATION IN THE NORTHWEST. Trans. 20th N. A. Wildl. Conf. p. 625-632. 1955.
Tells what is being accomplished by the following organizations or projects: The "Keep Green" Movement, The Tree Farm Movement, Conservation Workshops, The Tillamook Burn Tree Planting Project, Oregon Water Resource Committee, Conservation Education Committee, Junior Conservation Camps, Cooperative Conservation Projects, Bring Back Bitterbrush, and Anti-Litterbug Campaign. The author believes that cooperation between different organizations is now good in the Northwest and that conservation information really is reaching the public.

Stites, Wilbur D. (Ill. Dept. Cons.) LET'S USE RADIO. Trans. 20th N. A. Wildl. Conf. p. 603-609. 1955.
State conservation departments can use radio to good advantage as an educational medium to reach great masses of people at a minimum cost. The Ill. Dept. of Conservation's weekly 15 minute program, "Outdoors in Illinois," is carried by 46 stations and reaches about 5 million listeners a week. This is accomplished at an annual cost of about $3,000. Radio time is available to any conservation agency free, since all stations are required by the Fed. Com. Comm. to devote a portion of their time to public service programs. Conservation material qualifies as public service on an educational basis. Only one man is needed to produce radio material on a weekly year-round basis, under the method used in Ill. This method consists of recording the master program each week and making copies of this master recording on magnetic tapes for as many stations as desired.--W. D. Stites.

Turner, D. B. (B. C. Lands Service, Victoria.) SELLING CONSERVATION BY CONFERENCE. Trans. 20th N. A. Wildl. Conf. p. 641-653. 1955.
The British Columbia Natural Resources Conference has demonstrated that excellent results can be obtained in reconciling divergent conservation views by means of a campaign of education and information. Men in administration, development, and management of natural resources are brought together once each year to evaluate conservation policies and programs. The Conference is an independent educational organization representing Industry, University and Government. Every primary resource is represented. The great aim is to further fraternity among leaders in all resource fields. A second objective is to make proceedings of the meeting available to schools, to officials, to the press, and to citizen groups. Thus conservation is sold through conference in B. C. The Conference has gained recognition and prestige as an objective, educational organization that contributes to advancement of B. C. Similar accomplishment is well within the reach of every province and state in N. Am.--D. B. Turner.

WILDLIFE--TECHNIQUES

Adams, Lowell. (F&WS, Missoula, Mont.) A PUNCH-CARD BIBLIOGRAPHIC FILE FOR VERTEBRATE ECOLOGISTS. J. Wildl. Mgt. 19(4): 472-476, 1 fig. Oct. 1955.
A punch-card bibliographic file is described from the standpoint of subject classification, cross referencing, and cost. The system permits multiple cross referencing with only one card per title. The described card provides for an index to the personal literature file, citation to abstracts, author index, index to the vertebrates, year of publication, and subject index. Nine holes are uncoded for individuals to use in special ways. A code using superimposition allows the individual to establish his own subject-matter classification and to alter it from time to time to suit changing requirements.--Lowell Adams.

WILDLIFE—TECHNIQUES—Continued

Appelman, F. J. (Boreelstraat 7, Den Haag, Holland.) INVENTARAUFNAHME DES WILDBESTANDES IN EINER OBERFÖRSTEREI IN JAVA (NIED. INDIEN) IM JAHRE 1939. Z. Jagdwissensch. 1(2): 51-53. 1955.

English summary: "The staff of the Forestry Administration Ngawi in Java, comprising 47 000 ha, was obliged to take down every observation of game in a pocket book, stating the time, kind, and place. Within the thick virgin forest such observations were possible in the first place within cut through paths, where the game used to dry skin or feather above all during the wet season. The observations were gathered, examined, and taken down upon cards in ten day periods. In this way the stock of game could be estimated, and this estimation was much more reliable than the personal impression of only a few hunters. The material of numbers provided the Administration with valuable evidence for the decision if shooting should be allowed."

WILDLIFE—BIOMETRICS

Armitage, P. (London Sch. Hygiene & Trop. Med., Eng.) TESTS FOR LINEAR TRENDS IN PROPORTIONS AND FREQUENCIES. Biometrics 11(3): 375-386. Sept. 1955.

Discusses data consisting of a series of proportions that fall into some natural order and tests of significant trends in these data.--V. Schultz.

Hartley, H. O., P. G. Homeyer, and E. L. Kozicky. (Iowa St. Coll.) THE USE OF LOG TRANSFORMATIONS IN ANALYZING FALL ROADSIDE PHEASANT COUNTS. J. Wildl. Mgt. 19(4): 495-496. Oct. 1955.

Inasmuch as there was a tendency for the experimental standard deviation to vary in proportion to the 15-mile segment means, an analysis was made on use of log transformations in analyzing fall roadside pheasant counts in Iowa for a 15-year period. The use of logarithms did not decrease the average variance but merely eliminated its heterogeneity.--Authors.

McCarthy, Philip J. SAMPLING, ELEMENTARY PRINCIPLES. N. Y. St. Sch. Indus. & Labor Rel. (Cornell U.), Bul. 15. iii + 32 p. April 1951. 25¢.

A technical discussion of sample design and estimation as applied to estimation of proportions.--V. Schultz.

Moore, Paul. (Ohio Div. Wildl.) THE STRIP INTERSECT CENSUS. Trans. 20th N. A. Wildl. Conf. p. 390-405, illus. 1955.

The strip intersect census is a method of obtaining improved estimates under certain favorable conditions. It combines the strip sampling procedures of the King census method with the direct proportion principle of estimation proposed by Lincoln (1930). Concepts of the effective census strip and of home range are outlined. The actual census strip, an indefinite area in which varying sampling probabilities occur, may be compared to an effective census strip of definite width and 100% sampling probabilities. Home range is compared to a circular frequency distribution of occurrence which may be described by standard statistical terms, the standard deviation alone if the additional assumption of bivariate normal distribution is made. A circular area having a radius of 2 standard deviations is a useful approximation of average home range. Examples of situations requiring special consideration in census design are discussed. Experiences with various applications of the strip intersect census are outlined. Roadside strip censuses of low to medium pheasant breeding populations appear feasible unless nonrandom distribution of such populations is established. Both roadside and field strip censuses of pheasant broods, however, appear impractical. Field strip censuses of quail coveys have been conducted on a large scale, and appear to be especially suited to sample censusing of large areas or regions. Box trap strip censuses of rabbits are under extensive field tests and also appear practical for large area sampling.--Paul Moore.

WILDLIFE--BIOMETRICS--Continued

Schultz, Vincent. (Johns Hopkins Sch. Hygiene, Balt. 5, Md.) WILDLIFE SURVEYS: A DISCUSSION OF A SAMPLING PROCEDURE AND A SURVEY DESIGN. Tenn. Game & Fish Comm. 1-153 p., maps. 1955. [Request from publisher, not from author.]
This publication is essentially the same as the manuscript thesis listed in WR 77: 4. It contains information on: (1) methods of collecting information, (2) selecting and training personnel, (3) general field procedures, (4) questionnaires and field forms, (5) analysis, (6) preparation of final report, and (7) selected results of the survey to which the design was applied. The design discussed is that of the survey listed in WR 80: 4.--V. Schultz.

Spiegelman, Mortimer. INTRODUCTION TO DEMOGRAPHY. Soc. Actuaries. xxi + 309 p. 1955. $6.00 from Soc. of Actuaries, 208 S. LaSalle St., Chicago 4, Ill.
Should be of interest to those applying demographic methods to wildlife populations.--V. Schultz.

Stearman, Roebert L. (Johns Hopkins U., Sch. Hygiene, Balt. 5, Md.) STATISTICAL CONCEPTS IN MICROBIOLOGY. Bacteriological Reviews 19(3): 160-215, graphs. Sept. 1955.
This paper is recommended to all wildlife workers engaged in research. It is an excellent source of information for a biologist interested in reviewing or developing knowledge of statistical concepts. According to the author, the "...review will deal mainly with the basic concepts which underlie statistical tests... ...will be restricted to the concepts underlying the elementary methods involving the three basic distributions in statistics, namely, the normal, binomial, and Poisson distributions. In addition to discussing the basic concepts, an attempt will be made to point out some of the pitfalls which should be avoided." The use of microbiological examples should in no way interfere with the understanding of basic concepts.--V. Schultz.

Vaughan, Anna Elizabeth. ESTIMATION OF A BIOLOGICAL POPULATION WHICH IS SUBJECTED TO A BIASED MORTALITY. Ph. D. thesis, Stanford U. 51 p. 1955. [From long abstract in Dissertation Abstracts 15(10).]
Statistical procedure; applied to estimate of salmon population.

WILDLIFE--NATURAL AREAS AND REFUGES

Abbiatti, Ennio. (US F&WS, Boston, Mass.) PROBLEMS OF LAND ACQUISITION. Nature Conservancy (4200 22d St. NE., Wash. 18, D. C.), Inf. Bul. no. 14. 6 p., mimeo. Aug. 1955.
Valuable background information on appraisals, surveys, deeds, etc. for those interested in acquiring land for natural area preservation or other uses.

Anonymous. PUBLIC USE OF NATIONAL WILDLIFE REFUGES--1954. US F&WS, Wildl. Leafl. 366. 1-4 p. Apr. 1955.
Visitor-days of use for hunting, fishing, or miscellaneous purposes are tabulated for each refuge and summarized for each region and for nation. National totals were: for hunting, 361,366; for fishing, 1,612,189; miscellaneous (picnicking, swimming, nature study, etc.), 3,228,705; grand total, 5,202,260.

Anonymous. LIST OF INFORMATION ON THE NATIONAL WILDLIFE REFUGES, 1955. US F&WS, Wildl. Leafl. 368. 2 p. Sept. 1955.
Lists a number of official publications on federal refuges and tells how copies can be obtained.

Anonymous. NATURE CONSERVANCY POLICIES CONCERNING ACQUISITION OF LAND FOR PRESERVATION. Nature Conservancy (4200 22d St. NE., Wash. 18, D. C.), Inf. Bul. no. 16. 2 p., mimeo. Oct. 1955.

Anonymous. NATURE CONSERVANCY POLICIES CONCERNING MANAGEMENT OF AN AREA ACQUIRED FOR PRESERVATION. Nature Conservancy (4200 22d St. NE., Wash. 18, D. C.), Inf. Bul. no. 17. 1 p., mimeo. Oct. 1955.

WILDLIFE--NATURAL AREAS AND REFUGES--Continued

Butcher, Devereux. SEEING AMERICA'S WILDLIFE / IN OUR NATIONAL WILDLIFE REFUGES. Devin-Adair Co., N. Y. viii + 338 p., illus. 1955. $2.50, paper; $5.00, cloth.

This popular and attractive account of our national refuges and their animals is illustrated by more than 350 good halftones. The introduction by R. H. Pough outlines the goals of the book, namely to develop understanding of the importance of the refuge system and to report the opportunities for public enjoyment of the natural values of refuges. The next section discusses objectives of the refuges, best seasons for visits, and gives instructions for visitors. A third section tells of the history of wildlife destruction and preservation in America and the establishment of refuges. About 1/4 of the book consists of descriptions of 41 refuges that the author visited: their abundant or unusual animals, items of archeological or historical interest, location and accessibility, and tourist accommodations in the vicinity. Brief descriptions of other federal refuges are arranged alphabetically by state. Factual material of the book should be highly reliable, for the manuscript was checked by refuge personnel. Throughout the volume, Butcher, who is secretary of The Defenders of Furbearers, stresses the esthetic importance of wildlife and urges the need of a new public attitude under which hunting eventually may disappear. This philosophical bent will be objectionable to some readers but should not be allowed to obscure the fact that the book is useful, informative, and extremely well illustrated. Considerable subsidization must have been necessary to produce the volume at the prices asked.--Ray C. Erickson.

Hunt, Robley W. (Holt, Minn.) MUD LAKE NATIONAL REFUGE. Cons. Volunteer 18(107): 13-18, illus. Sept.-Oct. 1955.

Drainage followed by abandonment of cultivation resulted in creation of this 60,000-acre refuge in Minn. Impoundments are restoring the marshlands and making possible controlled water levels. Thousands of ducks are produced each year and the breeding goose population is being built up. Construction of nesting islands and share-cropping of farm crops help waterfowl. Moose are increasing. Furbearers and deer are harvested, as are clover seed, cattail fluff, honey, and wild and tame hay.

James, Harry C. OUR DESERTS ARE NOT EXPENDABLE. Nat. Mag. 48(9): 482-484, 496, illus. Nov. 1955.

Huge areas of desertland, including state park and federal refuge land, have been taken over by the military. This article tells how the habitat is ruined, sometimes so badly that not a bird or lizard exists, how wildlife from lizards to bighorns is slaughtered simply for targets, and how, when the military moves on, the ravaged areas are left posted with "Keep Out" signs that warn of unexploded ammunition.

Muhlbach, Walt L. CURRENT LAND DISPOSAL POLICIES OF THE UNITED STATES GOVERNMENT. Nature Conservancy (4200 22d St. NE., Wash. 18, D. C.), Inf. Bul. no. 15. 8 p., mimeo. Aug. 1955.

Information of importance in obtaining parcels of public domain or surplus government lands for conservation purposes.

Pough, Richard H. LIVING MUSEUM OF NATURAL HISTORY. Flicker 27(3): 109-115. Sept. 1955.

Exceptionally strong statement of the reasons for and the urgency of natural area preservation.

WILDLIFE--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Smith, Elizabeth. (U. Cincinnati Coll. Med.) A NEW APPARATUS FOR LONG TERM MEASUREMENT OF OXYGEN CONSUMPTION IN SMALL MAMMALS. Proc. Soc. Exp. Biol. & Med. 89(4): 499-501, illus. Aug.-Sept. 1955.

"A new closed-circuit apparatus has been described which continuously records oxygen consumption over periods of several days with automatic correction for changes in barometric pressure. The equipment is sensitive to less than 0.01 ml of oxygen per hour and can measure oxygen consumption over a wide range."

WILDLIFE--BIOTAS, COMMUNITIES, GENERAL ECOLOGY

Edwards, R. Y., and C. David Fowle. (B. C. For. Serv., Victoria, B. C.) THE CONCEPT OF CARRYING CAPACITY. Trans. 20th N. A. Wildl. Conf. p. 589-602. 1955.

A review of use of the term "carrying capacity" reveals serious differences of opinion as to its exact meaning. Some definitions are almost meaningless, some regard food as the main limiting factor and others consider carrying capacity to be a static attribute of the environment rather than dynamic. It is suggested that carrying capacity is determined by the whole environment, and that, with some reservations, the number of animals upon a unit of range is in itself a measure of the carrying capacity of that area. Carrying capacity is represented by the maximum number of animals of a given species and quality that can, in a given eco-system, survive through the least favorable environmental conditions occurring within a stated interval. Management should regard carrying capacity as a dynamic concept.--C. D. Fowle.

Peterson, Roger Tory, and James Fisher. WILD AMERICA. Houghton Mifflin, Boston. xii + 434 p., illus. 1955. $5.00.

Here is a delightful book that takes you to fascinating places and interesting animals. Peterson, famous for his bird guides, took Fisher, witty and prolific British ornithologist, for a 100-day, 30,000-mile trip around 3 sides of North America. Photographing at every point, they drove and flew from Newfoundland to the Dry Tortugas, through the Southwest with a side trip into the Mexican tropics, and up the Pacific Coast to Alaska, where they studied on the world's richest waterfowl tundra and on the bird-teeming Pribilof Islands. Peterson knew just where to go and had arrangements (for each day!) made in advance for special transportation and guidance by experts. Fisher viewed everything with a freshness no American could muster and with an excellent background of information. Americans will be deeply gratified by Fisher's reactions to our national parks, forests, and refuges; we hope the book has a good sale abroad. The authors take turns telling of their trip. Both have pleasing narrative style, and both give the reader not only entertainment but much fine, sound information about the animals and places they saw. Peterson's brilliantly executed black-and-white drawings seem as informative as photographs but more attractive. The result is a book that any naturalist, amateur or professional, should enjoy and consider worthwhile. Almost any naturalist knows some of the people and places that were visited and will take personal interest in the Peterson-Fisher view of them. If readers are like the reviewer, they will pick up illuminating facts about places they themselves have visited, and they will note only a few minor errors. Birds are the core of the book, of course; the authors ran up an all-time record list for one year--some 600 species, including many rarities. But mammals and other animals edge in at numerous places. Fur seals, written about in other works to the point of boredom, here receive not only several surprisingly interesting pages but a quantitative history in an appendix. The book is well printed and has a commendable index.

Smith, Ralph H. (N. Y. St. Cons. Dept.) DEFINITION OF GAME RANGE DIVISIONS IN NEW YORK. N. Y. Fish & Game J. 2(2): 127-141, map. July [Nov.] 1955.

Abstract: "In New York State, 11 game range divisions are delineated on the basis of differences in geology, topography, physiography, climate, soils, water areas, vegetation, land use, and the game species found or likely to succeed therein: Adirondack, Tug Hill, Ontario-St. Lawrence-Champlain, Erie-Ontario Lake Plain, Appalachian Plateau, Rensselaer Plateau-Taconic Mountain, Hudson Valley, Mohawk Valley, Catskill, Southeastern Highland, and Coastal Plain." Each of these regions is briefly described in respect to the features listed above.

WILDLIFE—NUMBERS AND NUMBER FLUCTUATIONS

Siivonen, Lauri, and Jukka Koskimies. POPULATION FLUCTUATIONS AND THE LUNAR CYCLE. Papers on Game Res. (Helsinki) 14. 1-22 p., 9 graphs. 1955.

Interaction of the lunar cycle with a sensitive critical period governing reproductive success is hypothesized as an explanation of wildlife population cycles. Under this hypothesis, cycles would be expected at average intervals of 3-4 and 9.6 years. Certain observed variations in cycles are also explainable by this hypothesis. The way in which the lunar cycle may affect the animals is discussed.—L. F. Stickel.

WILDLIFE—PARASITES AND DISEASES

Halloran, Patricia O'Connor. A BIBLIOGRAPHY OF REFERENCES TO DISEASES OF WILD MAMMALS AND BIRDS. Am. J. Vet. Res. 16(61, pt. 2). xi + 465 p. Oct. 1955. $10.00.

Ten years in preparation and containing thousands of references, this volume should be indispensable to anyone working with diseases, parasites, and anatomy of wildlife. The book is on a world basis and covers both game and nongame animals, so it should be of as much value to parasitologists, bacteriologists, public health workers, and zoo veterinarians as to wildlife pathologists. Arrangement is by species or group of mammal or bird. Below this level, arrangement is by such headings as Infectious Diseases, Parasites, Cardiovascular System, Genital System, and Tumors. "References to anatomy and anatomical anomalies have been included for the purpose of supplying information on the normal structure, which might tend to confuse the prosector unfamiliar with certain anatomical peculiarities of exotic species. Under the final heading of 'General and Miscellaneous' are included longevity, care and management, nutrition, albinism, anesthetics, and other pertinent information which could not be properly placed under any of the preceding headings." References to rabbits, rats, and hamsters are omitted for valid reasons. The authoress has worked through more than 900 publications, including wildlife management, ecological, and natural history journals as well as those on physiology, pathology and veterinary medicine. The result is a variegated set of references that should be of real value to workers in several fields even though it cannot be complete in any one field. One is surprised at some of the things omitted (papers on echolocation in bats, for example, as quite a few physiological papers are listed) and at some of the things included (e.g., an old paper on bat banding, but not the main one, which appeared later in same journal; and Grinnell's 1918 synopsis of bats of Calif.) There is no index, so a person concerned with a given disease will have to search under the name of each animal that might have had the disease. Bibliographic work in wildlife diseases will be aided enormously by this volume. Omissions, and slips in proof-reading, should be taken for granted; the marvel is that this huge and encyclopedic work was actually finished and published. For this the authoress deserves tremendous credit.

WILDLIFE—MORTALITY FROM INSECTICIDES, WEATHER, CARS, ETC.

Hooper, A. D., and J. M. Hester. (Ala. Dept. Cons.) A STUDY OF THIRTY-SIX STREAMS THAT WERE POLLUTED BY AGRICULTURAL INSECTICIDES IN 1950. Ala. Dept. Cons., Fisheries Rep. no. 2. 1-13 p., mimeo. Mar. 1955.

In 1950, severe boll weevil infestation caused heavy application of insecticides to cotton lands in northern Ala. Heavy rains made even more applications necessary and carried the poisons into streams. Some 42 to 88 lbs. of insecticides (including toxaphene, BHC, DDT, and aldrin) were used per acre of cotton. It was reported that "great quantities, if not most, of the bottom organisms as well as tons of fish were eradicated..." Some of the affected streams were studied in 1953. None appeared to be supporting a great variety of organisms and their fish populations were out of balance. "Originally, it was planned to study simultaneously several streams which had and had not been affected by insecticides. However, since it was impossible to find suitable streams which had not been affected by insecticides, no check or control streams were available."

WILDLIFE--MORTALITY FROM INSECTICIDES, WEATHER, CARS, ETC.--Continued

Report of the working party. TOXIC CHEMICALS IN AGRICULTURE / RISKS TO WILD LIFE. Her Majesty's Stationery Office, London. iv + 31 p. 1955. 1s 6d net from H. M. Stationery Off., 423 Oxford St., London, W. 1, Eng.

Report of committee set up to determine effects of insecticides and herbicides on wild and domesticated animals and plants of Britain. Presents findings based on reported damage and on field investigations. It is concluded that the number of casualties to birds and mammals from pesticides is not great at present. Organo-phosphorus insecticides are the most dangerous materials. Greatest hazard from pesticides seems to lie in their effects on insect fauna, particularly predators, parasites, and pollinators. Precautions to minimize damage are given. --P. F. Springer.

Rudd, Robert L., and Richard E. Genelly. (U. Calif., Davis.) CHEMICALS AND WILDLIFE--AN ANALYSIS OF RESEARCH NEEDS. Trans. 20th N. A. Wildl. Conf. p. 189-198. 1955.

The information needed to evaluate likelihood of wildlife loss from agricultural chemicals is discussed. Chemical and toxicological data are insufficient; environmental conditions modify toxicity evaluations from the laboratory. Greater attention should be given to the field phase of chemical research. Chemical manufacturers may be expected to participate actively in field research programs but should not be required to pursue wildlife investigations in addition to their other work. Several other organizations are better able to conduct the field studies necessary for a proper evaluation of chemical effects on wildlife. Varied examples are given of injury to wildlife by agricultural chemicals.--R. L. Rudd.

WILDLIFE--MANAGEMENT--GENERAL

Cottam, Clarence. (Welder Wildl. Found., Sinton, Texas.) PROGRESS IN WILDLIFE RESEARCH AND TRAINING. Trans. 20th N. A. Wildl. Conf. p. 39-60. 1955.

Major accomplishments include breeding ground surveys of migratory birds and development of the flyway concept. Planned, mass banding added much to our knowledge of migration, population dynamics, annual harvest, and other mortality factors. Studies of water manipulation have made possible great improvement of habitat; marsh ecological studies have greatly improved management possibilities. Notable progress has occurred in concepts of harvest and the necessity of keeping harvest in balance with habitat conditions. With upland and big game, the more frequent and serious mistakes have been associated with underharvesting. Recent studies of population dynamics have been major contributions. Many new techniques aid greatly in management and research. Noteworthy contributions have been made in the fields of controls, nutrition, food habits, and disease, yet much remains to be done. Federal aid programs have become the backbone of state management and research activities and many significant and noteworthy contributions are being made. Fish pond studies, survival ratios, electronic screens, shocking devices, and research using radioactive isotopes represent some major fishery research accomplishments. Many universities are making outstanding contributions. The major need in wildlife work is improvement in public relations and the "selling" of its program to the public.--C. Cottam.

Cowan, Ian McTaggart. (U. of B. C., Vancouver.) THE CHALLENGE WE TAKE -- APPRAISAL OF THE 20TH NORTH AMERICAN WILDLIFE CONFERENCE. Trans. 20th N. A. Wildl. Conf. p. 662-670. 1955.

The major needs, if our resource is to survive, are greater attention to fundamentals both in the training of professionals and in the prosecution of research. Education in the widest sense is of paramount importance, for wildlife and fisheries resources will survive only if we compete successfully for the minds of men.--I. McT. Cowan.

WILDLIFE--MANAGEMENT--GENERAL--Continued

Cronemiller, F. P. (US For. Serv., San Francisco, Calif.) SOIL SURVEYS FOR GAME-RANGE DEVELOPMENT. Trans. 20th N. A. Wildl. Conf. p. 532-539. 1955.
Soil surveys on wildlands can aid land management and game management agencies in cover improvement programs on better game ranges since they indicate what each soil type can or should produce. Soil surveys are guiding cover manipulation programs of the Calif. Dept. of Fish and Game and Region V, U. S. For. Serv., to increase markedly the habitat capacity for deer, rabbits and quail.--F. P. Cronemiller.

Edwards, William R. (Ohio Div. Wildl.) OHIO'S WILDLIFE RESEARCH PAYS OFF. Ohio Cons. Bul. 19(10): 4-5, 32, illus. Oct. 1955.
How scientific surveys and regulatory changes that sprang from them have put more game in the bag of the Ohio hunter.

WILDLIFE--MANAGEMENT--HARVESTS AND HUNTING

Barick, Frank B., and T. Stuart Critcher. (N. C. Wildl. Resources Comm.) STATISTICAL GAME KILL SURVEYS--SOME OBSERVATIONS ON FIVE YEARS OF OPERATION. 9th Ann. Meeting, SE. Assn. Game & Fish Comm's. 1-17 p., graphs, proc. Oct. 1955.
For 5 years, N. C. has sent an annual game-kill questionnaire to 4% of license holders. A follow-up mailing is made. Returns total 35-40%. A sample of non-repliers is interviewed and data are adjusted accordingly. Statewide kills are estimated and confidence limits for kill estimates are calculated. Cost of surveying and calculating, except for interviewing, is about $3,000 a year. Data for last 5 years are tabulated and graphed for each type of game. Findings and problems are discussed: Distribution of hunting pressure among different types of game varies little from year to year. Fluctuations appear in kills of game species, but it is uncertain whether these fluctuations in survey data reflect population changes, weather, or survey methods. Biological meanings of changes are also open to interpretation. Confidence limits are extremely wide, so much so that only the grossest differences are demonstrably significant. Statistical methods that will give much narrower confidence limits are badly needed. Species that would be expected to fluctuate together have not done so; rather, certain species that seem ecologically unrelated have tended to fluctuate together. It is clear that statewide kills do not fluctuate with some local kills. Workers using kill surveys of this type need: better analysis of biases in the method, narrower confidence limits, and more knowledge of biological and management significance of fluctuations in figures on total kills.

Legler, Eugene, Jr. (Tenn. Game Comm.) A GAME KILL STUDY COMBINING THE FIELD BAG CHECK QUESTIONNAIRE AND POST SEASON MAIL SURVEY, 1953-54. Tenn. Game & Fish Comm., Tech. Game Leafl. no. 1. i + 16 p. June 1954.
Tells how statewide survey was made and presents hunting statistics and kill data for each species or group of game in Tenn.

Legler, Eugene. (Tenn. Game Comm.) GAME KILL SURVEY 1954-55. Tenn. Game & Fish Comm., Tech. Game Leafl. no. 3. ii + 45 p., map. Aug. 1955.
Based on 28,094 bag checks and 3,002 post-season questionnaires. Resulting data on hunting statistics and kills in Tenn. are tabulated and discussed for each species or group. Methodology for such surveys is considered at various points, especially in the waterfowl section. In addition to regular hunting statistics, sex and age ratios are discussed for quail and drumming count routes for ruffed grouse.

Lindner, K. (Lichtenhaidestr. 9, Bamberg, Germany.) ÜBER DIE EUROPÄISCHE JAGDLITERATUR DES 12. BIS 15. JAHRHUNDERTS. Z. Jagdwissensch. 1(2): 84-92. 1955.
Discussion of study of early European literature on hunting. Has long English summary.

WILDLIFE--MANAGEMENT--HARVESTS AND HUNTING--Continued

Washington. [GAME KILLS OF RECENT YEARS IN WASHINGTON.] Wash. St., Game Bul. 7(4): 7, 12. Oct. 1955.
Table shows total kills of each species or type of game for each year 1950-54. Another table shows deer kill and hunter success, 1933-54.

WILDLIFE--MANAGEMENT--FARM

Baskett, Thomas S. (U. Mo.) EXPERIMENTAL TRIALS OF WILDLIFE FOOD AND COVER PLANTS. U. Mo., Agr. Exp. Sta. (Columbia), Res. Bul. 584. 1-24 p., 8 figs. July 1955.
Survival and vigor of Mo. experimental plantings after 10 to 13 growing seasons are clearly charted; the plots are described in detail. "Multiflora rose had an average survival rate of 67 percent, and vigor was generally good... Other plants which showed good survival and growth over a wide variety of conditions included gray dogwood and wild plum. Tartarian honeysuckle and a variant of black raspberry showed good survival and growth in moderate or good sites... Red cedar and oriental arbor-vitae showed only moderate survival but provided dense, rather durable cover... Most of the plants which were aggressive enough to grow well under the varied and often severe conditions...tended to spread within the plantations... The sizeable number of native species which performed at least moderately well in the wildlife trials serves as a reminder that odd areas on the farm often contain at least part of their own planting stock..."--L. F. Stickel.

Blackwell, William P. (Va. Comm. Game.) THE USE OF ANNUALS IN VIRGINIA'S FARM GAME PROGRAM. 9th Ann. Meeting, SE. Assn. Game & Fish Comm'rs. 1-5 p., proc. Oct. 1955.
The author shows why Va. now considers Lespedeza bicolor too costly, too slow to produce, too quickly choked out by honeysuckle, too little popular with landowners and hunters, and too little used by wildlife. Costs of bicolor are compared with costs for annual food-patch seed mixture, and a few data are given to show that the latter is more useful to wildlife. Summary: "It has been demonstrated to our satisfaction that annuals are superior to our present perennials for the following reasons. 1. Annuals are cheaper than perennials. 2. Annuals are utilized by more species of game than perennials. 3. Even in adverse years annuals will produce some seed. 4. Annuals are in great demand and are widely accepted by sportsmen and farmers. The popularity continues to expand annually. 5. The farmer will devote better land on his farm to plantings made on a temporary basis than he will to permanent ones. 6. The hunter finds more game utilizing annuals. 7. Annuals produce the same year that they are planted."

WILDLIFE--MANAGEMENT--FOREST AND RANGE

Christisen, Donald M., and Leroy J. Korschgen. (Mo. Cons. Comm.) ACORN YIELDS AND WILDLIFE USAGE IN MISSOURI. Trans. 20th N. A. Wildl. Conf. p. 337-357, graph. 1955.
Samples were taken from 5 oak species in 3 parts of Mo. Ozarks for 7 years. The feature of tree form that correlated best with acorn production was crown diameter. Annual yields were highly variable. Variation between individual trees was great. Post oak was a consistent but low producer; others were less consistent but better producers. Mature acorns comprised 44-94% of those from traps; 5-41% of these were sound; 7-22% were utilized by wildlife. Acorns in open quadrats were utilized by wildlife about twice as heavily as those in traps. Of mature acorns produced, 13.6% were taken from trees and 18.2% were taken from ground. Wildlife use was proportionately heavier in poor acorn years. Data are given on av. numbers of acorns produced per tree of the 5 species. A stand containing equal numbers of the 5 kinds of oaks, with total of 20 per acre, would produce 4,000 acorns (weighing 20 lbs.) per acre in good year; or 11 lbs. in poor year. Mo. food habits work on various species is reviewed to show

WILDLIFE--MANAGEMENT--FOREST AND RANGE--Continued

importance of acorns to wildlife. Squirrel populations in Mo. vary with abundance of acorns in fall immediately preceding squirrel production. Deer do more damage to crops, planted pines, and red cedar in poor acorn years. Examples are given to show that annual evaluation of acorn crops can furnish information useful in wildlife management. It is shown that the Mo. acorn crop is worth several million dollars annually.--From abstract by D. M. Christisen.

Engle, James W., Jr. (Va. Comm. Game.) ROLE OF GAME MANAGERS IN GAME AND FISH LAW ENFORCEMENT ON THE NATIONAL FORESTS IN VIRGINIA. 9th Ann. Meeting, SE. Assn. Game & Fish Comm's. 1-9 p., proc. Oct. 1955.
This paper and the one by Richards (listed below in this section) discuss the cooperative relationship between Va. Comm. Game & Inland Fisheries and U. S. Forest Service for wildlife management on the national forests of Va. They tell how the work is financed; what management is done; how the local game manager system operates; what the estimated populations and kill are for deer, bear, and turkey; and how law enforcement and administration are handled. The program is financed from PR funds and sale of special national forest stamps. Arrangements and results are considered satisfactory. So many developments have been made that maintenance of them now limits new undertakings. Progress is still being made, however, and wildlife is responding well. It is especially interesting to note that bears are thought to be increasing on national forest land.

Handley, Rolland B., and Austin C. Shattles. (Miss. Game Comm.) THE DEVELOPMENT OF PUBLIC HUNTING AREAS IN MISSISSIPPI. 9th Ann. Meeting, SE. Assn. Game & Fish Comm's. 1-10 p., proc. Oct. 1955.
Tells what Miss. is doing to develop areas managed for game and hunting. The Fla. system was followed. There are now 7 areas totaling 397,000 acres; they are forested and are chiefly for deer and turkey. Work on 500,000 more acres is planned. Handling of the 95,000-acre Red Creek Area is described as typical. Ten-year leases (for wildlife management only) were obtained gratis. Roads, firelanes, and fences are built and maintained cooperatively with owners. Controlled burning is done for mutual benefit, and so is fire fighting. Wildlife is also aided by food plantings, clearings, and water facilities. Plots of grasses and clovers are planted for turkeys. They are fertilized, disked, and seeded in fall and clipped regularly during summer. Clipping helps provide tender new growth and insects for turkeys. Hunting is kept as free and unregulated as possible, but managed hunts are held for deer and turkey. Hunter relationships are much improved, partly because game personnel care for and return hunting dogs lost on area.

Hill, R. R., and E. L. Boeker. (US For. Serv. & Colo. Game Dept.) HUNTING SEASONS AND FOREST FIRES IN COLORADO. J. Forestry 53(10): 707-710, graph. Oct. 1955.

Lay, Daniel W. (Tex. Game Comm., Buna.) EFFECTS OF PRESCRIBED BURNING ON FORAGE AND MAST PRODUCTION IN SOUTHERN PINE FORESTS. 9th Ann. Meeting, SE. Assn. Game & Fish Comm's. 1-18 p., proc. Oct. 1955.
Summary: "1. Prescribed burning in southeast Texas reduced browse for two years, and increased herbaceous forage for at least three years, but caused little change in total forage production. 2. Changes in floral composition caused by burning were more pronounced than changes in quantity of forage. The species which were reduced were holly, yaupon, black gum, yellow jessamine, dogwood, wax myrtle, and tree huckleberry. The species which were increased were grasses-sedges, herbs, French mulberry, Viburnum, Smilax, blackberry, sweetgum and sweetleaf. 3. Burning reduced the number of understory plants per acre of fruiting size 62 to 72 percent and the number of plants per acre with fruit 68 to 72 percent. Dogwood fruiting was increased 83 percent. 4. The benefits to be gained for a wildlife species through prescribed burning increase as the understory succession progresses away from the conditions desired for that species."

WILDLIFE--MANAGEMENT--FOREST AND RANGE--Continued

Richards, Elmer V. (Va. Comm. Game.) SOME ASPECTS OF THE COOPERATIVE GAME MANAGEMENT PROGRAM ON VIRGINIA'S NATIONAL FORESTS. 9th Ann. Meeting, SE. Assn. Game & Fish Comm'rs. 1-5 p. + map, proc. Oct. 1955.
See note under Engle's paper, listed above in this section.

Stoeckeler, J. H. DEER, MICE, AND HARES DAMAGE YOUNG ASPEN AND PAPER BIRCH PLANTINGS IN NORTHEASTERN WISCONSIN. US For. Serv., Lake States Exp. Sta. (St. Paul 1, Minn.), Tech. Notes no. 441. 1 p. Oct. 1955.
Small trees were planted in disked sod in ne. Wis. In 3 years about half the trees were killed, largely by Microtus. Microtus populations were high during the period. Deer killed a few trees and seriously injured many others, enough so that height growth of birch was nil. Snowshoe hares killed a few trees, but hare damage was low, perhaps because planting was well out in an open area.

WILDLIFE--MANAGEMENT--WET-LAND

Dickerson, L. M. (US Soil Cons. Serv.) WEED CONTROL IN SMALL PONDS. Va. Wildl. 16(11): 10-13, illus. Nov. 1955.
Fertilizing, mowing, pulling, draining, and herbiciding are discussed. Dilution tables for several chemicals are included.

Luethy, Don R. (Fla. Game Comm.) NOXIOUS VEGETATION CONTROL. Fla. Game & Fresh Water Fish Comm., Bul. no. 2. 31 p., mimeo., illus. May 1955.
Essentially, this is a report on water-hyacinth control in Fla. for fishery resource improvement, from April 1952 to June 1953. During this period, undesirable plants were cleared from 31 lakes or streams and partially controlled in 16 others. The program's unique cost-sharing basis appears to be largely responsible for its success; individuals or organizations requesting vegetation control are required to pay the cost of chemicals used. Total costs per acre averaged about $8 with the Commission shouldering about 5/8 of the bill. An important stipulation requires opening of bodies of water to public use following control of undesirable vegetation. For aerial treatments of hyacinths, 0.5 gallon of 2,4-D ester (3.34 pounds acid equivalent) per acre in oil carrier is recommended. In places where aerial treatment was not feasible, 2,4-D amine was sprayed from airboats, the recommended dosage being 0.75 gallon of the herbicide at 4 pounds acid equivalent per acre in water carrier.--A. C. Martin.

Martin, Alexander C. (Patuxent Refuge, Laurel, Md.) ANOTHER WATERCHESTNUT INFESTATION. J. Wildl. Mgt. 19(4): 504-505, 2 figs. Oct. 1955.
There are now 4 main areas of Trapa natans infestation in e. U. S. The newly discovered one is in Gunpowder River and Bird River, a few miles e. of Baltimore, Md., and near upper Chesapeake Bay. The plant and its ecology and the damage it does are described briefly. Early control is essential to avoid huge, costly programs. "Good results with 2,4-D have been obtained at the rate of 8 pounds per acre of the acid equivalent and with 50 gallons of spray applied per acre. Oil or water solutions are nearly equally effective... Spraying with 2,4-D during two or three successive years can eliminate waterchestnut beds to the extent that remaining scattered plants can be pulled by hand. However, patrol and control may need to be maintained for an indefinite number of additional years in order to avoid loss of all ground gained." The plant is said to be losing ground in Europe; the cause is being sought for possible application here.

WILDLIFE--MANAGEMENT--WET-LAND--Continued

Meyers, Kent E. (US F&WS, Homosassa Springs, Fla.) MANAGEMENT OF NEEDLERUSH MARSH AT THE CHASSAHOWITZKA REFUGE. 9th Ann. Meeting, SE. Assn. Game & Fish Comm's. 1-5 p., proc. Oct. 1955.

Findings discussed here appear very significant and probably constitute one of the most valuable contributions to waterfowl habitat improvement in coastal marshes. Transformation of 100 acres of marshland which was previously unused by waterfowl into habitat attractive to large numbers of the birds suggests encouraging possibilities for the extensive domain of needlerush marshes. Part of the waterfowl response here may relate to the replacement of needlerush by saltgrass with good seed production and by local stands of gulfcoast spikerush. Good control of needlerush was obtained by aerial application of 2,4-D, mowing, burning, and combinations of these techniques. Proper timing was important. Though much remains to be learned about needlerush management, the Chassahowitzka operations have made 2 important revelations: (1) effective control can be obtained at a cost as low as $12.50 per acre and (2) some dense needlerush marsh areas can be made attractive to waterfowl.--A. C. Martin.

Olson, Theodore A. (U. Minn., Sch. Pub. Health.) STUDIES OF ALGAE POISONING. Flicker 27(3): 105-108. Sept. 1955.

General discussion of algae poisoning, report of 2 Minn. episodes, results of testing algal poisons on laboratory animals. Author suggests that algae poisoning is usually unrecorded and that its cumulative effect may be considerable.

Rawls, Charles K., Jr. (Tenn. Game & Fish Comm.) A REPORT ON EXPERIMENTAL CONTROL OF GIANT CUTGRASS (ZIZANIOPSIS MILIACEA), 1950-1954. 9th Ann. Meeting, SE. Assn. Game & Fish Comm's. 1-34 p., proc. Oct. 1955.

It is acknowledged that this 5-year study has not produced a fully satisfactory means of controlling giant cutgrass. Nevertheless, the undertaking appears a credit to Mr. Rawls and the Tenn. Game and Fish Comm., for only by patient, persistent testing of this type can needed facts be obtained. Tests are reported in detail. Rawls found that Polybor-chlorate at 1 lb. per gallon of water is an effective, economical control agent for giant cutgrass in flooded areas. For non-flooded sites, he recommends 2,4,5-T at 2 ounces, Dalapon at 4 ounces, or Polybor-chlorate at 1 to 1.5 lbs. per gallon of water. Also, he believes that Dalapon, Kuron, and Chlorax liquid merit further tests on this plant.--A. C. Martin.

Smith, Ralph H. (N. Y. St. Cons. Dept.) EXPERIMENTAL CONTROL OF WATER CHESTNUT (TRAPA NATANS) IN NEW YORK STATE. N. Y. Fish & Game J. 2(2): 173-193, illus. July [Nov.] 1955.

Report of research on life history and control. The plant was found to be strictly annual, reproducing solely by seeds, which may all germinate next season, but which can remain dormant for several years. Seeds are thought to be transported on fishing nets and the like. Mowing (without removal) does not prevent seed formation; furthermore, mowers do not get into shallows where many Trapa are. Control must come before seeds form or it is too late. Tests with various herbicides applied with different sorts of equipment "showed that an application of the amine salts of 2,4-D at a rate of 8 pounds acid equivalent per acre in 50 gallons of total solution per acre, with either fuel oil or water as a diluent, would cause a satisfactory kill of water chestnut. Isolated infestations were reduced from dense mats to as few as one plant per year in a period of 3 to 4 years, when seed suppression was complete each season. Application of herbicide by means of helicopters, to get complete coverage of all... areas each year, is considered a promising approach to the problem."

WILDLIFE--MANAGEMENT--WET-LAND--Continued

U. S. Fish and Wildlife Service. WETLAND INVENTORIES OF STATES.

Reports listed here were prepared in regional offices, and in the office of Missouri River Basin Studies, U. S. Fish and Wildlife Service, with the cooperation of state game and fish departments and others. The reports are based on aerial and ground studies, interviews, and much work with aerial photographs. Each report describes types of wetlands found in the state and gives an appraisal of wildlife values of each type. Acreages of types are tabulated in detail, with particular attention to waterfowl values. Reports also discuss such topics as "Trends in Land Use and Economic Development Affecting Wetlands" and "Problems and Opportunities in Wetland Development."

All publications of this series are processed, paper-bound, and are 8 x 10.5 in. Pagination, dates, and illustrations are as indicated for each.

The list that follows was compiled for Wildlife Review through the courtesy of James O. Stevenson, Samuel P. Shaw, and others in the Branch of River Basin Studies, Fish and Wildlife Service, Washington.

These inventories were published by and are available from the offices indicated below. Do not request from Washington office.

State wetland reports available from US F&WS, Region 1, 1001 NE. Lloyd Blvd., Portland 14, Oregon.

California. INVENTORY OF WETLANDS FOR THE STATE OF CALIFORNIA.
54 p., 8 photos, 3 maps. July 1954.

Idaho. INVENTORY OF WETLANDS FOR THE STATE OF IDAHO.
39 p., 4 photos, 3 maps. Feb. 1954.

Nevada. INVENTORY OF WETLANDS FOR THE STATE OF NEVADA.
34 p., 5 photos, 3 maps. May 1954.

Oregon. INVENTORY OF WETLANDS FOR THE STATE OF OREGON.
38 p., 5 photos, 3 maps. Mar. 1954.

Washington. INVENTORY FOR THE STATE OF WASHINGTON.
42 p., 8 photos, 3 maps. Apr. 1954.

State wetland reports available from US F&WS, Region 2, P. O. Box 1306, Albuquerque, New Mexico.

Arizona. WETLANDS INVENTORY ARIZONA.
14 p., 8 photos, 2 maps. Nov. 1954.

Colorado. WETLANDS INVENTORY COLORADO.
17 p., 14 photos, 2 maps. Jan. 1954.

Kansas. WETLANDS INVENTORY KANSAS.
10 p., 11 photos, 2 maps. Nov. 1954.

New Mexico. WETLANDS INVENTORY NEW MEXICO.
16 p., 6 photos, 2 maps. Oct. 1954.

Oklahoma. WETLANDS INVENTORY OKLAHOMA.
13 p., 7 photos, 2 maps. Jan. 1955.

Texas. WETLANDS INVENTORY TEXAS.
17 p., 19 photos, 2 maps. Nov. 1954.

Utah. WETLANDS INVENTORY UTAH.
14 p., 5 photos, 2 maps. Jan. 1955.

State wetland reports available from US F&WS, Region 3, 1006 West Lake St., Minneapolis 8, Minnesota.

Illinois. WETLANDS INVENTORY ILLINOIS.
19 p., 6 photos, 4 maps. May 1955.

Indiana. WETLANDS INVENTORY INDIANA.
13 p., 14 photos, 5 maps. Apr. 1954.

Iowa. WETLANDS INVENTORY IOWA.
41 p., 17 photos, 15 maps. Mar. 1955.

Michigan. WETLANDS INVENTORY MICHIGAN.
19 p., 12 photos, 9 maps. Mar. 1955.

Minnesota. WETLANDS INVENTORY MINNESOTA.
43 p., 14 photos, 5 maps. Apr. 1955.

Missouri. WETLANDS INVENTORY MISSOURI.
19 p., 12 photos, 8 maps. Apr. 1955.

Ohio. WETLANDS INVENTORY OHIO.
24 p., 7 photos, 5 maps. Apr. 1955.

Wisconsin. WETLANDS INVENTORY WISCONSIN.
33 p., 17 photos, 11 maps. Feb. 1955.

State wetland reports available from US F&WS, Missouri River Basin Studies, P. O. Box 1361, Billings, Montana.

Montana. WETLANDS INVENTORY OF MONTANA.
21 p., 6 photos, 3 maps. Oct. 1954.

Nebraska. WETLANDS INVENTORY OF NEBRASKA.
28 p., 1 photo, 3 maps. July 1954. Reissued May 1955.

North Dakota. WETLANDS INVENTORY OF NORTH DAKOTA.
30 p., 14 photos, 7 maps. Mar. 1955.

South Dakota. WETLANDS INVENTORY OF SOUTH DAKOTA.
49 p., 17 photos, 7 maps. Dec. 1954. Reissued May 1955.

Wyoming. WETLANDS INVENTORY OF WYOMING.
33 p., 9 photos, 3 maps. Apr. 1955.

State wetland reports available from US F&WS, Region 4, Peachtree-7th Bldg., Atlanta 5, Georgia. [Photos and maps will be included in all Region 4 reports when re-runs are made.]

Alabama. THE WETLANDS OF ALABAMA IN RELATION TO THEIR WILDLIFE VALUE.
25 p. 1954.

Arkansas. THE WETLANDS OF ARKANSAS IN RELATION TO THEIR WILDLIFE VALUE.
26 p. 1954.

Florida. THE WETLANDS OF FLORIDA IN RELATION TO THEIR WILDLIFE VALUE.
58 p., 28 photos. 1954.

Georgia. THE WETLANDS OF GEORGIA IN RELATION TO THEIR WILDLIFE VALUE.
34 p. 1954.

Kentucky. THE WETLANDS OF KENTUCKY IN RELATION TO THEIR WILDLIFE VALUE.
20 p. 1954.

Louisiana. THE WETLANDS OF LOUISIANA IN RELATION TO THEIR WILDLIFE VALUE. 31 p. 1954.

Mississippi. THE WETLANDS OF MISSISSIPPI IN RELATION TO THEIR WILDLIFE VALUE. 44 p. 1954.

North Carolina. THE WETLANDS OF NORTH CAROLINA IN RELATION TO THEIR WILDLIFE VALUE. 32 p. 1954.

South Carolina. THE WETLANDS OF SOUTH CAROLINA IN RELATION TO THEIR WILDLIFE VALUE. 37 p. 1954.

Tennessee. THE WETLANDS OF TENNESSEE IN RELATION TO THEIR WILDLIFE VALUE. 23 p. 1954.

Virginia. THE WETLANDS OF VIRGINIA IN RELATION TO THEIR WILDLIFE VALUE. 29 p. 1954.

State wetland reports available from US F&WS, Region 5, 1105 Blake Bldg., Boston 11, Massachusetts.

Connecticut. WETLANDS INVENTORY OF CONNECTICUT. 17 p., 2 maps. June 1954.

Delaware. WETLANDS INVENTORY OF DELAWARE. 15 p., 2 maps. Nov. 1953.

Maine. WETLANDS INVENTORY OF MAINE. 15 p., 4 maps. Jan. 1954.

Maryland. WETLANDS INVENTORY OF MARYLAND. 15 p., 2 maps. Dec. 1954.

Massachusetts. WETLANDS INVENTORY OF MASSACHUSETTS. 14 p., 2 maps. Oct. 1954.

New Hampshire. WETLANDS INVENTORY OF NEW HAMPSHIRE. 14 p., 3 maps. June 1954.

New Jersey. WETLANDS INVENTORY OF NEW JERSEY. 16 p., 2 maps. Mar. 1954.

New York. WETLANDS INVENTORY OF NEW YORK. 18 p., 3 maps. May 1955.

Pennsylvania. WETLANDS INVENTORY OF PENNSYLVANIA. 15 p., 4 maps. June 1954.

Rhode Island. WETLANDS INVENTORY OF RHODE ISLAND. 9 p., 2 maps. Jan. 1954.

Vermont. WETLANDS INVENTORY OF VERMONT. 12 p., 3 maps. June 1954.

West Virginia. WETLANDS INVENTORY OF WEST VIRGINIA. 10 p., 2 maps. Apr. 1954.

WILDLIFE--REPORTS OF ORGANIZATIONS

California. FORTY-THIRD BIENNIAL REPORT OF THE DEPARTMENT OF FISH AND GAME FOR THE YEARS 1952-1954. Calif. Dept. Fish & Game, Sacramento. 1-96 p., illus. Nov. 1954.

The report on game management (p. 45-56) includes: discussions and figures on status and bags of various types of game in recent years; figures on use of cooperative pheasant hunting areas; management of waterfowl areas; stocking of pen-reared pheasants and chukars (stocking of Reeves pheasant is being discontinued); report on habitat improvement by means of new guzzlers, spring development, brush removal, and reseeding; special deer seasons; work of disease laboratory; control of predatory mammals and birds; summaries of research projects. Some of the tables in appendix show: regular season deer kill, by counties, 1950-53; pumas bountied, by counties, 1951-53; catch of other mammalian predators, by counties, 1952-53; crows and magpies bountied, 1952-53; cost and size of each state game area; releases of game-farm birds, 1952-53; hunting statistics for waterfowl management areas and pheasant cooperative hunting areas. Other portions of the report tell of the great increase in hunters and fishermen at the same time as the resources for their use are shrinking, and of estimates of needs of the department in next 10 years.

Gabrielson, I. N. (Wildl. Mgt. Inst.) GABRIELSON REPORT. Ore. St. Game Comm. Bul. 10(11): 3-7. Nov. 1955.

Condensation of the Gabrielson evaluation of organization and activities of the Ore. St. Game Comm.

Maryland. BOARD OF NATURAL RESOURCES, ELEVENTH ANNUAL REPORT, 1954. Md. Bd. Nat. Resources, St. Off. Bldg., Annapolis. xiii + 165 p., illus. [1955.]

Includes reports of Dept. of Game & Inland Fish and Dept. of Research and Education. Among the game subjects taken up are: statements on what has been done in habitat improvement; figures on animals stocked or transplanted; brief summaries of research on dove, quail, muskrats, waterfowl, and gray squirrels.

West Virginia. ANNUAL REPORT OF CONSERVATION COMMISSION, 1954-55. W. Va. Cons. 19(8): 1-42, illus. Oct. 1955.

Report on game management (p. 20-29) gives brief summaries of investigations of deer, quail and rabbit populations, turkey kill, and gray squirrel management. It also tells in interesting fashion what was accomplished in farm and forest wildlife management, and what was done on management areas. Figures are given on game transplanted, and on beaver harvests and prices (1947-55).

MAMMALS--FAUNAS AND MANUALS

Bourlière, Francois. MAMMALS OF THE WORLD / THEIR LIFE AND HABITS. Alfred A. Knopf, N. Y. (Printed in France.) 223 p., illus. 1955. $12.50.

Admirable photographs of mammals, many of them in their native habitats, are the core of this book. There are 216 photographs, 24 in color, all reproduced beautifully by a very fine-screen process. Bourlière selected them for interest and beauty. He wisely used a few shots that stand out for interest and action rather than photographic excellence; these add to enjoyment of the book. There are also 34 good line drawings by Paul Barruel. The book itself is large (8.5 x 11 x 3/4 in.) and sumptuously produced. The text takes up mammals by major habitats: tropical forests, deserts, prairies, far north, mountains, etc. This allows the author to review briefly the mammal fauna of each region of the earth, and to discuss conservation status of areas as well as species. The approach does, however, make it necessary to look in various places for information on a given continent or a given group. Fortunately, the index to species is good. It includes scientific names parenthetically, thus lightening the text. The text tells a little about adaptations, ranges, and habits of a wide variety of mammals, but not much about any one thing. Topics shift almost by the line and some paragraphs do little more than list other mammal groups in a region. One wonders whom the book is for. Although superficially popular, it is too

MAMMALS--FAUNAS AND MANUALS--Continued

technical for the layman, too brief and incomplete for the professional, and too fragmentary to be readable to anyone except the most avid naturalist. On the other hand, the author is a good scientist of wide learning; he strives to give facts and to avoid sensationalism. In general, his facts seem to be reliable, but he appears to have trusted his memory too far at a few places, as when he speaks of wolves now being in e. U. S. only in N. Y. (Mich. or Minn. meant?), woodchucks being animals of the plains (into which they scarcely range), and chipmunks practically never climbing trees (which they commonly do).

Guilday, John E. (810 Holland Ave., Pittsburgh 21, Pa.) ANIMAL REMAINS FROM AN INDIAN VILLAGE SITE, INDIANA COUNTY, PENNSYLVANIA. Pa. Archaeologist 25(2): 142-147. Aug. 1955.

Study of bones and bone fragments from a village that was inhabited 400-500 years ago. Animals represented by remains but no longer in the area are wolf, bobcat, beaver, rice rat, elk, and wild turkey. Significant by their absence are red fox, opossum, and porcupine. The fauna was entirely modern in aspect, but rice rat would not be expected in the region. The author suggests that perhaps the rice rat followed Indian settlement and held the niche now occupied by the Norway rat.

Hoffmeister, Donald F., and Woodrow W. Goodpaster. (U. Ill.) THE MAMMALS OF THE HUACHUCA MOUNTAINS, SOUTHEASTERN ARIZONA. Ill. Biol. Monog. 24(1). vi + 152 p., illus. 1954. $3.00, paper; $4.00, cloth. [From review by Bryan P. Glass, Quart. Rev. Biol. 30(2).]

"The greater part of the book is devoted to a synoptic list of the mammals of the area. Each species is listed with its principal synonyms, together with records of occurrence, and in many cases comparisons with closely related subspecies. Of particular interest are the concluding remarks, which frequently contain considerable information on ecology and life history. Notable contributions are made to the knowledge of the desert shrew, Notiosorex crawfordi, the long-tongued bat, Choeronycteris mexicana, and the long-nosed bat Leptonycteris nivalis."

Lechleitner, R. R. (Mont. St. U.) MAMMALS OF GLACIER NATIONAL PARK. Glacier Nat. Hist. Assn. (West Glacier, Mont.), Spec. Bul. no. 6. 92 p., illus. 1955. $1.00.

Sanderson, Ivan T. LIVING MAMMALS OF THE WORLD. Hanover House, Doubleday & Co., Garden City, N. Y. 1-303 p., illus. 1955. $9.95.

A beautiful book that would be well worth its cost if the text were reliable. It is handsomely illustrated with 330 photographs, 190 in full color. Most of these are good, some are excellent. They make perusal of the book a fascinating experience. The volume itself is attractive with its glazed paper, fine printing, large (8.5 x 11 in.) double-column pages, and pleasing cover. Typographical errors are few, but Napeozapus becomes "Neozapus" and Pitymys appears as "Pitmys." The text scans the world's mammals, stopping with families in some groups but going down to species in others, depending on the probable interests of the public, for whom the book is designed. In general, treatment is by groups of species. Each section consists of a quantity of descriptive material of questionable interest and value followed by natural history comments. When we study sections on animals about which we have some knowledge, we find that the text is riddled with error and speckled with unnatural history and personal opinion. A few samples follow:

Shrews and red squirrels hibernate. The smaller a thing is the slower it falls. There is no true difference between hares and rabbits. Neither hares nor rabbits live in woods or forests. European hare is source of domestic breeds. Norway rat probably is finest product of nature. House mouse probably does more good than harm. Bobcats may attack people on sight. Cheetahs have proved to be the only successful means of killing coyotes in sw. U. S. Coati ranges n. to Okla. Bassariscus ranges e. to Ala. The only "true canine" that is not a wolf is the dingo. Grizzly bears climb trees. Spotted skunks have pure white tails. (Continued on next page.)

MAMMALS--FAUNAS AND MANUALS--Continued

Such boners as these on well known species make one distrust the whole text. The book is not documented and no one is credited with having criticized the ms. A naturalist's feeling toward the book is not warmed by occasional descriptions of mammals or their attributes as stupid, horrid, ghastly, revolting, hideous, atrocious, or ridiculous. The dust jacket claims that the book is "absolutely complete, modern, and accurate...the finest and most authoritative...tremendous value to the student, layman and scientist...an invaluable reference work." If the book was intended to fit this description, one must commiserate with the publisher as well as with the hordes of trusting readers and librarians who will come to this impressive-looking volume in search of dependable information.

MAMMALS--COMMUNITIES, NUMBERS, HOME RANGES

Christian, John J., and David E. Davis. (Nav. Med. Res. Inst., Bethesda 14, Md.) REDUCTION OF ADRENAL WEIGHT IN RODENTS BY REDUCING POPULATION SIZE. Trans. 20th N. A. Wildl. Conf. p. 177-189, graphs. 1955.

Deterioration of the physical condition of mammals coincident with high population density is well known. If this deterioration is a response to stress, then reducing population density should reduce stress with a consequent improvement in the condition of the animals. In the present experiments, the density of 3 urban populations of Norway rats was reduced an average of 42%. Adrenal weights were reduced 23.6% in ♀♀ and 27.6% in ♂♂ following initial population reduction. Populations were sustained an average of 32% below the pre-reduction densities by monthly trapping for a period of seven months. During this period adrenals of ♂ rats averaged 24.4% and adrenals of ♀ rats 16.9% below pre-reduction weights. Changes in adrenal weight were significant. --J. J. Christian.

MAMMALS--PARASITES AND DISEASES

Eads, R. B., J. S. Wiseman, J. E. Grimes, and G. C. Menzies. (Texas St. Dept. Health.) WILDLIFE RABIES IN TEXAS--A PRELIMINARY REPORT. Pub. Health Rep. 70(10): 995-1000, illus. Oct. 1955.

Summary: "Investigators...report observations of a close association between Mexican free-tailed bats...and certain carnivores, especially the raccoon. During November 1954 and April 1955 they examined a number of raccoon droppings found within a central Texas cave inhabited by a colony of the free-tailed bats. The droppings were composed largely of bat fur and bone." There was "a high level of rabies infection in the bat population within the study cave. Transmission of the rabies virus to raccoons and other carnivorous animals through the agency of infected bats is being investigated." Paper includes survey of literature on predation on American bats. Authors apparently suspect that bats may get rabies from vampires in Mexico, then migrate northward into U. S. where they fall prey to local carnivores which become infected in turn.

Harper, T. A., R. A. Ruttan and W. A. Benson. (Dept. Nat. Resources, Regina, Sask.) HYDATID DISEASE (ECHINOCOCCUS GRANULOSUS) IN SASKATCHEWAN BIG GAME. Trans. 20th N. A. Wildl. Conf. p. 198-208, illus. 1955.

Investigations of hydatid disease in Sask. big game were conducted Nov. 1953 to Feb. 1955. Twenty-nine of 96 moose (Alces americana), 3 of 14 barren ground caribou (Rangifer arcticus), and 2 of 20 white-tailed deer (Odocoileus virginianus) examined contained hydatid cysts of the tapeworm Echinococcus granulosus. Mule deer (Odocoileus hemionus), elk (Cervus canadensis), and antelope (Antilocapra americana) were also examined. A map showing records of the disease in Sask. is included.--T. A. Harper.

MAMMALS--CONTROL, MORTALITY

Burkholder, Bob L. CONTROL OF SMALL PREDATORS. US F&WS, Cir. 33. 1-8 p., illus. 1955. 5¢ from Superintendent of Documents.
Brief statements of control methods preferred for such animals as raccoon, skunk, weasel, rat, and dog. In addition, exclusion by fencing and methods of trapping are discussed in general.

MAMMALS--SHREWS, MOLES, BATS

Bell, J. F., W. J. Hadlow, and W. L. Jellison. (Rocky Mtn. Lab., Hamilton, Mont.) CHIROPTERAN RABIES IN MONTANA. Pub. Health Rep. 70(10): 991-994, 1 fig. Oct. 1955.
Report of study of rabies virus from sick Eptesicus fuscus found in the wild. This was first reported case of rabies from Mont. in 2 years.

Burns, Kenneth F., and Charles J. Farinacci. (Med. Center, Ft. Sam Houston, Texas.) RABIES IN NONSANGUIVOROUS BATS OF TEXAS. J. Infect. Dis. 97(2): 211-218, illus. Sept.-Oct. 1955.
Summary: "1. Clinical rabies is recognized as occurring in the Mexican free-tailed bats (Tadarida mexicana) of Texas. 2. The isolation and identification of two strains of rabies virus from the brains of nonsanguivorous bats is reported. 3. Neutralization tests performed in mice on the serums of apparently normal healthy bats revealed the presence of neutralizing antibody for the virus of rabies in a large percentage of specimens. 4. The results seem to indicate that nonsanguivorous bats (Tadarida mexicana) may be a reservoir for the virus of rabies in the State of Texas."

Crowcroft, Peter. (Bur. Anim. Pop., Oxford U., Eng.) NOTES ON THE BEHAVIOR OF SHREWS. Behavior 8(1): 63-80. 1955.
Nest building, burrowing habits, aggressive behavior, and mating behavior of captive British shrews. "The aggressive behavior is shown to function as territorial behavior since fighting success is dependent upon the situation in which contact occurs."--L. F. Stickel.

Dodgen, Charles Lee. STUDIES ON THE ENERGY SOURCES OF THE BAT. Ph.D. thesis, Vanderbilt U. 116 p. 1955. [From long abstract in Dissertation Abstracts 15(8).]
Physiological study of amounts and sources of energy utilized by Myotis during hibernation and dehibernation. Much of the energy is obtained from fat, but a significant amount apparently is derived from protein.

Findley, James S. SPECIATION OF THE WANDERING SHREW. Ph. D. thesis, U. Kans. 110 p. 1955. [From long abstract in Dissertation Abstracts 15(9).]
Sorex pacificus, yaquinae, obscurus, and vagrans are shown to be intergrading subspecies. The chain of races has some overlapping of ranges without intergradation. Twenty-nine subspecies of S. vagrans are recognized. A theory is advanced for the speciation history of the group. All N. Am. species of Sorex are placed in just 2 subgenera, Sorex and Otisorex. These subgenera are defined. Phylogenetic relationships and evolutionary history of Otisorex are discussed.

Godfrey, Gillian K. (Mrs. Crowcroft) (Zool. Soc. London). A FIELD STUDY OF THE ACTIVITY OF THE MOLE (TALPA EUROPAEA). Ecol. 36(4): 678-685, maps & graphs. Oct. 1955.
Direct information was obtained about the activity of moles by labelling individuals with tail-rings containing radioactive cobalt and locating them at frequent intervals with a Geiger-Müller counter unit. Home range and movement data are mapped in detail for several males. Individuals studied were found to have a short-term rhythm of approximately 8 hours, of which 3.5 were spent in rest. Digging occupied between one- and two-thirds of the 4.5 hours of activity. Amounts of time spent digging and traveling varied between pasture and cultivated land.

MAMMALS--SHREWS, MOLES, BATS--Continued

Handley, Charles Overton, Jr. (US Natl. Mus.) A REVISION OF THE AMERICAN BATS OF THE GENERA EUDERMA AND PLECOTUS. Ph. D. thesis, U. Mich. 247 p. 1955. [From long abstract in Dissertation Abstracts 15(8).]

"This paper concerns the related American bats of the nominal genera Euderma, Idionycteris, and Corynorhinus, and their Eurasian counterparts, Barbastella and Plecotus. Its purpose is to clarify the taxonomy of the American forms, determine their relation to the Eurasian forms, and ascertain, as far as possible, the course and rate of evolution in the group." Corynorhinus and Idionycteris are reduced to subgenera of Plecotus and many taxonomic changes are proposed in Corynorhinus.

Lidicker, William Z., Jr., and Wayne H. Davis. (U. Ill.) CHANGES IN SPLENIC WEIGHT ASSOCIATED WITH HIBERNATION IN BATS. Proc. Soc. Exp. Biol. & Med. 89(4): 640-642, illus. Aug.-Sept. 1955.

"An important factor concerned with the mechanism of hibernation in bats is the storage of erythrocytes and possibly whole blood in the spleen while in the hibernating state. Furthermore, it is believed that the rapidity with which a bat can empty its spleen is closely associated with its ability to come rapidly out from deep hibernation, as well as from various degrees of 'daytime sleep.' This mass release of cells from the spleen may be important in increasing the oxygen supply to the tissues, and may also be one of the factors stimulating the heart to greater activity (through the Bainbridge reflex)."

Sealander, John A., and Howard Young. (U. Ark.) PRELIMINARY OBSERVATIONS ON THE CAVE BATS OF ARKANSAS. Proc. Ark. Acad. Sci. 7: 21-31, illus. 1955.

Summary: "1. Thirty cave locations are listed for the Ozark Mountain region of Northwest Arkansas. The occurrence of seven species of bats in these caves is shown. 2. A key to Arkansas cave bats is shown. 3. A total of 1,129 bats of five species was wing-banded from February 1951 to January 1953. Recovery data on pipistrelle bats, which comprised the largest number of bats banded, are shown. All recoveries were in the location of original banding. 4. Sex ratios...showed a marked preponderance of males in all cases. A few sex ratios for clusters of gray and Indiana bats are given. 5. Weights of banded pipistrelles showed a steady decline from autumn to spring. 6. Ectoparasites recovered from several species of bats have been identified."

Twente, John W., Jr. (U. Mich.) SOME ASPECTS OF HABITAT SELECTION AND OTHER BEHAVIOR OF CAVERN-DWELLING BATS. Ecol. 36(4): 706-732, graphs. Oct. 1955.

Detailed account of research on Myotis velifer, Corynorhinus rafinesquei, Eptesicus fuscus, and Antrozous bunkeri in Kans. and Okla. Some of the topics considered are: stimuli that cause awakening from hibernation, choice of hibernation site in relation to local temperature, choice of resting site during feeding season, function of clustering in warm and cool seasons, reason for fall increase of weight, species differences in choice of resting sites, function of trial and error in choice of site, reactions to light, night behavior, and care of young. It is shown that choice of hibernation site is governed largely by need of keeping cold during hibernation so as to reduce metabolism; each species meets this need in a different way, even in the same cavern. During the feeding season, warmer parts of caverns are chosen, presumably to facilitate digestion. Autumn weight rise may be caused by continued feeding at time when low temperatures permit low metabolism during rest.

MAMMALS--RABBITS AND PIKAS

Corder, Edward Lawrence, Jr. FOOD HABITS OF THE COTTONTAIL RABBIT IN SOUTHERN ILLINOIS. M. A. thesis, So. Ill. U. v + 38 p. 1955.
Cottontail foods were studied on 2 areas during 1952. Chief method was microscopic analysis of 290 droppings, but cuttings were observed in field. Herbaceous plants were used almost entirely. Grasses were eaten at all seasons. Kentucky bluegrass was most important grass. Broomsedge was taken when young and succulent. Woody plants were little used, but tender bark was gnawed somewhat during dry summer and fall. Corn, wheat, and soybeans were eaten on agricultural land. Grasses, horse nettle, and brambles were eaten on fallow land. Many other common plants were utilized. Seasonal changes in diet are described. Author suggests that cottontails eat such a variety of foods that food is not likely to be a limiting factor. "Thus, it would seem that the ideal environment for the cottontail is one which provides a variety of plants for food and cover. Agricultural land usage presents such variety provided fence row growth is allowed to furnish cover."

Couturier, M. (45 Rue Thiers, Grenoble, France.) DAS HAARKLEID DES ALPENSCHNEEHASEN. Z. Jagdwissensch. 1(1): 8-21, illus. 1955.
Has English summary. Detailed study of hairs and pelages of Lepus timidus. Pelage variations in different regions and possible reasons for them are also discussed.

Fenner, Frank, and I. D. Marshall. (Australian Natl. U., Canberra.) OCCURRENCE OF ATTENUATED STRAINS OF MYXOMA VIRUS IN EUROPE. Nature 176(4486): 782-783. Oct. 22, 1955.
By now it has become rather uncommon to find highly virulent strains of myxoma in Australian rabbits, and relatively mild strains have begun to appear in Britain.

Geis, Aelred D. (Mich. St. U.) TRAP RESPONSE OF THE COTTONTAIL RABBIT AND ITS EFFECT ON CENSUSING. J. Wildl. Mgt. 19(4): 466-472. Oct. 1955.
Rabbit live-trapping data displayed non-random trap response when analysed statistically. Many rabbits rarely entered traps while a smaller number were captured frequently. This heterogeneous trap response did not represent differences in age or sex. Census methods based solely on live-trapping data, and which assume a uniform probability of capture, yielded population estimates that were apparently far lower than the actual population. More accurate population estimates were obtained when the marked-unmarked ratio in the population was determined from a shot sample instead of from live-trapping data alone.--A. D. Geis.

Hildreth, A. C., and G. B. Brown. PROTECTING TREES AND SHRUBS FROM RABBIT DAMAGE / NATURE OF DAMAGE, REPELLENTS, PREPARATION, APPLICATION. US Dept. Agr., Leafl. no. 396. 1 sheet folder, illus. Sept. 1955. 5¢ from Supt. Documents.
Active ingredients of repellents described are nicotine sulfate or thiram. Directions are given for mixing and using these in asphalt emulsions.

Latham, Roger M. (Pa. Game Comm.) THE CONTROVERSIAL SAN JUAN RABBIT. Trans. 20th N. A. Wildl. Conf. p. 406-414. 1955.
About 50,000 of these rabbits are taken annually from San Juan Is. despite poisoning by farmers, and despite good populations of minks, raccoons, cats, dogs [and, no doubt, hawks and owls]. Questionnaire replies from 41 state game departments revealed that no state favored releases of these rabbits, but that only 28 states had power to control releases. The Am. Rabbit Breeders Assn. is strongly against releases of San Juans because of myxomatosis threat to domestic rabbits [and because of possible economic competition]. Some 7,000 San Juans have been turned loose in Pa. in last few years. Survival has been generally poor, but a few have survived 2 winters. The rabbits have not had to do much burrowing, for they have used woodchuck burrows freely. They have been disappointing for hunting, as they usually provide a poor chase and tend to stay in deep burrows during the day. Already they have been reported doing

MAMMALS--RABBITS AND PIKAS--Continued

more damage to woody plants in winter than cottontails would do. Data are also given on history of these rabbits, weights, colors, etc. There are several reasons to think San Juans could succeed and become pests in this country. They have taken hold elsewhere from tropics to nearly arctic regions, and control efforts have been desperate but futile. They have their young in burrows, where they are safe from many hazards of cottontails. They dig burrows when needed and make effective use of them. There is no reason whatsoever to think that hunting could control them. Discussion that follows paper is unusually valuable.

Lemke, C. W., and Louis Oshesky. (Wis. Cons. Dept.) ALIAS: SAN JUAN RABBIT. Wis. Cons. Bul. 20(11): 9-11, 40, illus. Nov. 1955.
This article reviews familiar material, but contains some statements worthy of quotation: "Although it is illegal to release these animals in Wisconsin without permission, we are by no means protected from the natural spread of a successful release in a neighboring state where it may be made legally. There have been releases in several states recently, both legally and illegally. None of the plants have shown much success, fortunately. Why should anyone oppose further releases of these rabbits if they have shown no sign of success to date? It's a lot like playing Russian roulette; if you keep at it long enough you get a hole in the head." If this beast ever becomes established here, "it may knock the carp, the starling, the English sparrow and the common rat out of any further consideration for the title of 'worst wildlife import ever made by the United States.'"

Linder, Raymond L. USE OF REARING COVER BY MEARNS COTTONTAIL IN DECATUR COUNTY, IOWA. M. S. thesis, Iowa St. Coll. 113 p., illus. 1955. [Copy in US Dept. Int. Library.]

Tilgner, D. J. (Gdansk, Poland.) PRODUKTIVITÄT UND QUALITÄT DER HASENSTRECKEN 1953. Z. Jagdwissensch. 1(2): 75-77. 1955.
Has English summary. Harvests of Lepus europaeus in Poland vary from 15 to 50 hares per 100 ha. Sex ratio is essentially even. Av. wt. in 1953 was 4.2 kilos; maximum was 5 kilos. Production of young was very low in the dry year of 1953. Edible parts of a hare average 35.4% of wt. Hare meat contains about 0.2% fat and about 25% protein.

Watson, J. S., and R. M. Williams. (DSIR, Wellington, N. Z.) THE RELATIONSHIP BETWEEN PAUNCHED AND DEAD WEIGHTS OF RABBITS. N. Z. J. of Sci. & Tech., Sec. B, 37(1): 54-58, graph. July 1955.
Summary: "Regression lines were calculated for the relation between the dead and paunched weights of wild rabbits [Oryctolagus]. Significant differences were found between the two sexes, between samples killed by three different methods, and between animals killed at different times of day. These differences can be mainly accounted for by variations in the gut contents, and it is concluded that, for the purposes of demographic analysis, it is preferable to use the paunched rather than the dead weight for classifying rabbits."

MAMMALS--RODENTS--MISCELLANEOUS

Brand, Raymond Howard. ABUNDANCE AND ACTIVITY OF THE WOOD MOUSE (PEROMYSCUS LEUCOPUS NOVEBORACENSIS) IN RELATION TO THE CHARACTER OF ITS HABITAT. Ph. D. thesis, U. Mich. 168 p. 1955. [From long abstract in Dissertation Abstracts 15(8).]
Based on live trapping on George Reserve, Mich. Traps were widely separated and placed in a variety of habitats. Among topics considered are: sex and age ratios, population fluctuations throughout year, weather conditions that affect numbers of captures, and habitat features that are correlated with mouse numbers.

Caroline, Milton. COTTON RATS. US F&WS, Wildl. Leafl. 353. 2 p. July 1953.
Notes on habits and appearance and suggestions for poisoning.

MAMMALS—RODENTS—MISCELLANEOUS—Continued

Chitty, Dennis. (Bur. Anim. Pop., Oxford U., Eng.) DISCUSSION OF POPULATION FLUCTUATIONS OF THE FIELD VOLE (Allgemeine Gedankengänge über die Dichteschwankungen bei der Erdmaus (Microtus agrestis). Z. Säugetierk. 20: 55-60, 2 figs. (1952) 1955.
In German.

Clarke, J. R. (Oxford U., Eng.) INFLUENCE OF NUMBERS ON REPRODUCTION AND SURVIVAL IN TWO EXPERIMENTAL VOLE POPULATIONS. Proc. Royal Soc. B, 144: 68-85, illus. 1955.
Two Microtus agrestis populations kept in outdoor cages were studied for 18 months. One population started with 12 voles, the other with 4. Growth rate in the larger population was less than in the smaller, the breeding season was shorter, and females born in it were less fertile. Infant and juvenile survival was poorer than that of adults in both populations. Aggressive activity and wounding were present in both groups, but more frequent in the larger group. "It is suggested that the strife between the members of each population was limiting their growth, but that this restraint was more severe in the larger than the smaller group."—L. F. Stickel.

Eadie, W. Robert. (Cornell U.) AIRPLANE VS. MOUSE. Farm Research (N. Y. Agr. Exp. Sta., Geneva.) 21(4): 4. Oct. 1955.
Orchard mice (primarily Microtus) are being controlled in N. Y. by cracked corn (poisoned with 2% zinc phosphide) distributed by plane. Planes fly just over each tree row and release 6-8 lbs. bait per acre. Costs range from $1.50 to $2.00 per acre. Indications are that the treatment reduces mouse populations by 70-90%. Hazard to other wildlife is said to be slight as long as bait is dropped into grass, not onto bare areas.

Elliott, H. Nelson. WOOD RATS. US F&WS, Wildl. Leafl. 354. 2 p. July 1953.
Notes on habits, relationship to human diseases, and suggestions for control.

Gardner, Marshall Closson. TAXONOMIC REVIEW OF THE COTTON RATS (GENUS SIGMODON) OF THE EASTERN UNITED STATES. M. S. thesis, Geo. Wash. U. 44 p. 1950. [Copy in US Dept. Int. Library.]

Hooven, Edward F. MIDSUMMER BAITING TO CONTROL SEED-EATING MAMMALS. Ore. St. Bd. Forestry, Res. Note no. 22. 1-4 p. Mar. 1955.
A 500-acre plot was selected in Douglas fir country of Ore. The plot was at one edge of an area burned the year before. The plot was treated in Aug. with 1/4 lb. per acre of wheat coated with 1080 and safflower oil. A line of live traps caught 24 Peromyscus maniculatus just before poisoning, 3 after 3 weeks, 13 after 5 weeks, and 17 after 9 months. Probable source and fate of mice is considered. Control was not considered satisfactory. Previous studies indicate that "baiting in midfall or early winter would produce better results since there is a natural decrease in rodent populations during this period."

Sealander, John A., Jr., and Barry Q. Walker. (U. Ark.) A STUDY OF THE COTTON RAT IN NORTHWESTERN ARKANSAS. Proc. Ark. Acad. Sci. 8: 153-162, graphs. 1955.
A worthwhile life-history study that takes up habitat, runways, times of activity, observations of predation on cotton rats, weights and measurements of age groups, body weight and fat accumulation, observed sex ratios, litter size, breeding potential, and probable length of breeding season.

Thompson, Daniel Q. (U. Mo.) THE ROLE OF FOOD AND COVER IN POPULATION FLUCTUATIONS OF THE BROWN LEMMING AT POINT BARROW, ALASKA. Trans. 20th N. A. Wildl. Conf. p. 166-176, 3 figs. 1955.
Annual measurements were made of forage growth, forage utilization and lemming population characteristics from 1950 to 1954. Two successive years of heavy clipping by lemmings caused a fifty per cent decrease in forage growth in 1953. The decrease in food and cover in 1953 was accompanied by a decline in lemming reproduction in 1953 and a failure to make a reproductive gain over the winter of 1953-54. Predators were an important source of mortality. Tundra habitats are briefly discussed.—D. Q. Thompson.

MAMMALS--RATTUS AND MUS

Anonymous. USE OF WARFARIN FOR THE CONTROL OF RATS AND MICE. US F&WS, Wildl. Leafl. 361. 4 p. Aug. 1950.
This leaflet, not previously listed in WR but now rather dated, gives general, early data on use of warfarin. It is now listed here only for bibliographic purposes.

Southwick, Charles H. (Ohio U., Athens.) REGULATORY MECHANISMS OF HOUSE MOUSE POPULATIONS: SOCIAL BEHAVIOR AFFECTING LITTER SURVIVAL. Ecol. 36(4): 627-634, graphs. Oct. 1955.
Litter survival in penned house mouse populations decreased as number of mice increased. Aspects of social behavior that increased in intensity with crowding were aggressiveness, gregariousness, intermingling of sexes, nest destruction, and abnormal communal nesting. All apparently had detrimental effects on litter survival but they interacted with each other so that it was difficult to evaluate their relative importance.--L. F. Stickel.

MAMMALS--SCIURIDS

Buell, Noble E. PRAIRIE DOGS AND THEIR CONTROL. US F&WS, Wildl. Leafl. 357. 4 p. Aug. 1953.
Notes on habits and rather detailed instructions for control.

Flyger, V. F. (Md. Dept. Game, Balt. 2, Md.) IMPLICATIONS OF SOCIAL BEHAVIOR IN GRAY SQUIRREL MANAGEMENT. Trans. 20th N. A. Wildl. Conf. p. 381-389, 1 fig. 1955.
A study of individually marked squirrels in 2 Md. woodlots from 1952-1955 showed that the squirrels were not territorial but were often social in nature. They possessed a definitely hierarchial type of social structure. Of 16 squirrels trapped elsewhere and released in the woodlots, only one remained and the others disappeared.--V. F. Flyger.

Kidd, J. B. (La. Wild Life Comm.) SQUIRREL RESEARCH. La. Cons. 8(2): 10-11, 21-22, illus. Nov. 1955.
Hunting statistics and data on age and sex ratios, numbers, and travels. Based on bag checks, live trapping, and other work. Pertains to both gray and fox squirrels. Av. kill per hunting effort in 1954-55 was 1.9 where hunting pressure was high, 2.7 where pressure was normal. Nearly 2 million squirrels were bagged in La. in 1953-54, when hunter success was less that in 1954-55. About 52% of squirrels shot were males. Age ratios varied, but adults apparently outnumbered young in both years. Tag recoveries suggest that percentage of squirrels shot is small, perhaps not greatly over 8%. Most tagged squirrels made only "local" movements, but some traveled 2 to 9 miles. Censuses suggest that there is 1 squirrel per 6-7 acres of squirrel habitat, with a maximum--for areas studied--of 1 per acre.

Ludeman, John A. TREE SQUIRRELS AND CHIPMUNKS - THEIR HABITS AND CONTROLS. US F&WS, Wildl. Leafl. 355. 5 p. July 1953.
Notes on habits and instructions for various control methods.

Ohio. [HIGH SQUIRREL POPULATION IN 1955 AND ITS RELATION TO LONGER SEASON.] Ohio Div. Wildl., Game Surv. News 2(4): 4 p., maps & graph. Sept. 1955.
It is shown that the 1955 Ohio squirrel population is up by 41% over 1954. 1955 is the third year in which the season has been 30 rather than 15 days. The longer seasons have increased squirrel harvests by more than 20%, on the average, without causing decrease in future populations. Consequently, a 60-day season is being tried in several public hunting areas.

MAMMALS—SCIURIDS--Continued

Uhlig, Hans G. (W. Va. Cons. Comm.) THE GRAY SQUIRREL / ITS LIFE HISTORY, ECOLOGY, AND POPULATION CHARACTERISTICS IN WEST VIRGINIA. W. Va. Cons. Comm., Final Rep. PR Proj. 31-R. 1-181 p., graphs & maps. July 1955.

This large (8.5 x 11 in.), processed, paper-bound volume is one of the more detailed and important works on biology and management of squirrels. Uhlig studied squirrels in W. Va. for several years and has written a number of good papers on his work. (Most of them are not cited here, oddly enough. See WR.) Here all his information is brought together and integrated with data from the literature. The paper includes 62 tables and 25 maps and graphs. The summary occupies more than 4 pages and the bibliography has 70 entries. A few of the topics taken up are: population densities required for average hunting, proportion of population taken by hunters, relative importance of spring and summer litters, rearing success, methods of aging, significance and interpretation of age and sex ratios, food consumption, study of tree dens and leaf nests, census methods, relation of population levels to mortality, effects of various management practices, suggested liberalization of bag limits and length of season, objectives in practical habitat management.

Uhlig, Hans G. (Cons. Comm. W. Va.) THE DETERMINATION OF AGE OF NESTLING AND SUB-ADULT GRAY SQUIRRELS IN WEST VIRGINIA. J. Wildl. Mgt. 19(4): 479-483, 2 figs. Oct. 1955.

Description is given of development of nestling and sub-adult gray squirrels up to 18 wks. of age. Squirrels are born naked. Body is covered with hair at 4 wks. Underside of tail is not furred until 6 wks. Majority of squirrels have clear eyes by 5th wk. Ears open between 3rd and 4th wks. Lower incisors erupt at 3 wks. Hind foot measurements offer good index of age until 4th wk. Weight in grams provides good indication of age up to 7th wk. and fair index up to 18th wk. A relationship between body length and tail length was found, with a definite inflexion at body length of 140 mm. (5 wks.); this inflexion reflected a rapid increase in tail growth. A relationship between body length and weight is also discussed and graphed.--H. G. Uhlig.

MAMMALS--BEAVER

Beer, James R. (U. Minn.) MOVEMENTS OF TAGGED BEAVER. J. Wildl. Mgt. 19 (4): 492-493. Oct. 1955.

A small series of beaver was live trapped, ear tagged, and released at point of capture. Ten beaver were subsequently retaken. Adults were quite sedentary. Kits and yearlings were retaken in colonies as much as 51 miles from point of original capture.--James Beer.

Buckley, John L., and W. L. Libby. (U. of Alaska.) GROWTH RATES AND AGE DETERMINATION IN ALASKAN BEAVER. Trans. 20th N. A. Wildl. Conf. p. 495-507, illus. 1955.

Based on marking over 200 beaver, examination of 164 carcasses, and measuring of more than 7,000 pelts since 1951. Alaskan beaver have a step-like pattern of growth, rapid in summer and negligible in winter, which permits segregation of age classes. Kits weigh 10-21 lbs. and have pelt measurements up to 52 in.; yearlings, 22-31 lbs. and 53-59 in.; two-year-olds, 32-40 lbs. and 60-64 in.; and adults, over 40 lbs. and 64 in. Using pelt measurements, the harvest is segregated into age classes, which, combined with data on trapping success (obtained from affidavits), permits evaluation of population condition and leads to management recommendations. An age-determination method, based on proximity of temporal ridges of skulls, is described and illustrated.—J. L. Buckley.

Lawrence, William H., and S. A. Graham. (U. Mich.) PARASITES AND DISEASES OF THE BEAVER (CASTOR CANADENSIS KUHL) / AN ANNOTATED BIBLIOGRAPHY. Mich. Wildl. no. 2. 1-6 p. Nov. 1955.

Chronological listing, with brief abstracts, of 52 publications or unpublished reports. Following this section, references are listed for each parasite or disease.

MAMMALS--BEAVER--Continued

Libby, Wilbur L. A BASIS FOR BEAVER MANAGEMENT IN ALASKA. M. S. thesis, U. Alaska. xii + 80 p., illus. 1954. [Copy in US Dept. Int. Library.]

Rutherford, William H. (Colo. Game Dept.) WILDLIFE AND ENVIRONMENTAL RELATIONSHIPS OF BEAVERS IN COLORADO FORESTS. J. Forestry 53(11): 803-806. Nov. 1955.

Findings of 3-year field study of 1 stream that had beaver and 1 that practically lacked beaver. Factors favoring beaver occupancy for long periods are stream gradients of 8% or less, presence of forest types that follow fire, and soils that do not erode easily. Readily erosible soils lead to severe cut-bank erosion at ends of dams. Beaver work favors minks, production of forage for big game, and large waterfowl production where otherwise there would be none (figures are given). Animals which are not, in final analysis, substantially increased or decreased by beaver work include muskrat, snowshoe hare, marten, canids, blue grouse, pine squirrel, and non-game birds. Reasons are discussed. Relatively new beaver ponds seem to produce bigger and better brook trout than do streams; old ponds apparently produce brook trout that are light in relation to length. Management implications: Beaver populations are not advantageous on streams having unfavorable soil, gradient, or food conditions. On suitable streams, and when sustained-yield is practiced for population control, beavers are beneficial to wildlife, fish, forage and watershed values. Management should be based on ecological principles (such as those outlined) and should be on a watershed basis.

MAMMALS--MUSKRAT AND NUTRIA

Bednarik, Karl. AN ECOLOGICAL AND FOOD HABITS STUDY OF THE MUSKRAT IN THE LAKE ERIE MARSHES. M. S. thesis, Ohio St. U. 123 p. 1953.--D. L. Leedy. [Copy to be placed in US Dept. Int. Library.]

Ensminger, Allan B. (La. Wildl. Comm.) THE ECONOMIC STATUS OF NUTRIA IN LOUISIANA. 9th Ann. Meeting, SE. Assn. Game & Fish Comm's. 1-10 p., proc. Oct. 1955.

Nutria injure rice crops, do a great deal of damage to levees, destroy some corn and sugar cane, attack garden vegetables that are near nutria habitat, cut some small hardwood trees, and graze down cattle pastures in the marsh so badly that it may be impossible to get a good burn. Nutria do not seem to compete much with muskrats, for muskrats mainly eat underground parts while nutria feed chiefly on green tops. Nutria eat-outs, therefore, may revegetate in 1 season rather than the 8-10 years required for muskrat eat-outs. Trappers have to discard many undersize nutria. Nutria pelts are far more troublesome to process than muskrat pelts are, but most trappers are getting used to the new methods. Today nutria are the leading fur animals of La. About 900,000 have been pelted since 1945. Price is expected to hold at around $2.75 for top pelts. The animals are of no real value in clearing weeds from ponds, but they do tend to open up a dense marsh, permitting good duck foods such as millet to come in. The flesh is very good eating and its use is being promoted.

Rawey, Edwin, Jessop B. Low, and David Sharp, Jr. THE MUSKRAT / A FARM CROP. Utah St. Agr. Coll., Ext. Cir. 168. 1-16 p., illus. 1952?

This popular pamphlet discusses briefly the habits and biology of muskrats; tells what features make a good muskrat marsh, gives short instructions for diking, ditching, fencing, burning, etc., and takes up trapping and care of pelts.

MAMMALS--MUSKRAT AND NUTRIA--Continued

Schofield, Raymond D. (Mich. Dept. Cons., E. Lansing.) ANALYSIS OF MUSKRAT AGE DETERMINATION METHODS AND THEIR APPLICATION IN MICHIGAN. J. Wildl. Mgt. 19 (4): 463-466, 5 figs. Oct. 1955.

Author's summary: "Biologists examined 425 muskrats trapped on the Rose Lake Wildlife Experiment Station 1949-1953. Eight age determination methods were tested in an effort to determine which method would be most accurate and usable in Michigan... The pelt primeness pattern provided accurate age data. The method also has great utility as it is possible to examine a trapper's season catch, or large numbers of pelts at fur houses without the necessity of making daily contacts. If it is desirable to examine muskrats before skinning, the external sex characteristics should prove most reliable as age indicators. Internal age determination by testes and uteri, although accurate, are time-consuming. It is also necessary to examine the carcass soon after skinning."

Wilson, Kenneth A. (N. C. Wildl. Resources Comm.) A COMPENDIUM OF THE PRINCIPAL DATA ON MUSKRAT REPRODUCTION. N. C. Wildl. Resources Comm., Job Completion Rep., Fed. Aid Proj. W-6-R. 1-11 p., processed. Sept. 1955.

A digest of information from 38 references that are cited. Topics discussed are time of breeding, length of estrous cycle, gestation period, and litter size in many regions. A table shows what has been found for different regions about av. number of embryos, av. number of placental scars, av. litter size, and number of litters per year.

MAMMALS--FURBEARERS--GENERAL

Anonymous. 15 YEARS OF IOWA TRAPPING. Iowa Cons. 14(9): 164-165, illus. Sept. 1955.

Two pages of tables for 12 species of Iowa fur animals show reported number of each kind caught, average value, and total value for each year, 1939-55.

Legler, Eugene, Jr. (Tenn. Game Comm.) THE 1953-54 FUR TAKE REPORT. Tenn. Game & Fish Comm., Tech. Game Leafl. no. 2. 1-5 p., proc. July 1954.

The fur harvest and its value is reported by species on the basis of questionnaire data from trappers and reports from fur buyers. Methods are described for gathering and handling data for statewide fur reports of this type.

Wilson, Kenneth A. (N. C. Wildl. Resources Comm.) FUR RESOURCES OF NORTH CAROLINA. N. C. Wildl. Resources Comm., Fed. Aid Project W-6-R. 1-59 p., illus. July 1955.

Useful, extension-type pamphlet that contains some information of value to technical men. Twenty-one pages take up fur animals species by species, with drawings, maps of ranges in state, and paragraphs on description, N. C. distribution, habitat, food, and habits. General abundance of each species is also discussed. Nine pages treat fur values of each species in recent years, with estimates of total fur harvests in state. A table (p. 57) shows that N. C. fur houses paid more for pelts, on average, than did out-of-state fur houses. Ten pages on "Fur Resources Management" cover such topics as predation on muskrats, the question of whether fur animals are increasing or decreasing, and habitat improvement. Under the latter, Wilson discusses methods of improving muskrat marshes by diking, burning, plant control; improvement of woods for raccoons by sparing den trees, putting up boxes, encouraging fruit and mast plants, and excluding pigs; and desirability of ceasing mink trapping each year before too many ?? are caught. Instructions for trapping occupy 9 pages; this section includes figures on earnings of trappers.

MAMMALS--BEARS

Glover, Fred A. (US F&WS, Wash., D. C.) BLACK BEAR DAMAGE TO REDWOOD REPRODUCTION. J. Wildl. Mgt. 19(4): 437-443, 4 figs. Oct. 1955.

Author's summary: "The black bear was found to be responsible for most of the bark and cambium damage to redwood reproduction in Humboldt County, California. There was a steady increase in extent and intensity of bear depredations on redwood to the peak year of 1950. In 1951 and 1952 there was a slight decrease. Second-growth timber 10-30 years old was injured most, but there were indications that the 5- to 10-year age class was being damaged with increased intensity. The annual tree-damage period occurred during spring and summer months and varied from 75 to 120 days."

Spencer, Howard E., Jr. (Me. Dept. Game.) THE BLACK BEAR AND ITS STATUS IN MAINE. Me. Dept. Inland Fisheries & Game, Game Div. Bul. no. 4. 1-55 p., illus. Jan. 1955.

General habits, litter size, growth and weight, seasonal food habits, sex ratio, distribution and abundance in state, types of damage done, damage claims paid, cost and effect of bounties, recreational and economic values, recommendations. About 79% of Maine has resident bears. Evidence of various types indicates that there are some 5,000 to 7,000 bears in state and that population is increasing. Bag records show a young:adult ratio of 1:3.5 and 136 ♂♂:100 ♀♀. Av. size of 38 litters was 2.4. It seems possible to ascertain age from canine tooth sections but this has not been worked out. Food habits are reported in detail. On year-round basis, diet contained only 8.1% animal matter. No evidence of deer killing was found, though occasionally reported. Bear damage is considered thoroughly. Most important damage by bears is killing sheep in remote pastures near woods. Bears are highly prized game animals. Carcasses bring good prices. Bounty costs state about $12,000 per year and damage payments cost about $10,000. Bounty should be removed, for it is too costly and ineffective. Damage payments should be continued. Bear hunting should be popularized to increase hunting pressure. Trapping and sale of bears should be permitted, as at present, until hunting pressure is adequate.

Storer, Tracy I., and Lloyd P. Tevis, Jr. (U. Calif., Davis.) CALIFORNIA GRIZZLY. U. Calif. Press, Berkeley and L. A. xii + 335 p., 36 figs., 2 col. pls. 1955. $7.50.

The distinguished authors of this book have uncovered a wealth of source material. They have written a scholarly and well documented volume that tells in lively fashion all that they could discover about their long-exterminated subject. Beginning with a review of bears of the world (with maps), and a summary of history of grizzly classification, the book takes up history of grizzlies in Calif.; physical features; habits; relations with Indians, Spaniards, and Americans; bear-bull fights; grizzly hunting; Grizzly Adams; captive grizzlies; grizzly lore; and the grizzly as a Calif. emblem. Appendixes list all known Calif. specimens, last Calif. records, Indian names, and sources of information. The book is fascinating reading for anyone interested in habits and biology of bears, early history, and bloody adventure. The authors infer that grizzlies were fairly common and widely distributed in Indian days but that they reached genuine abundance only after Spanish colonists saturated the countryside with livestock. Perhaps there were then some 10,000 grizzlies in Calif. American settlers attacked the grizzlies in every imaginable way and killed them by thousands for well over half a century before the goal of extermination was attained. Today fragments of 66 individuals--a few bones and faded skins--remain to show us what the Californian grizzly looked like. The paucity of biological information that was obtained suggests that no time should be lost in studying grizzlies in areas where civilization has not yet eliminated them.

MAMMALS--RACCOON AND RINGTAIL

Kilham, Lawrence, and Carlton M. Herman. (Rocky Mtn. Lab., Hamilton, Mont.) SEVERE INFESTATION OF BLOW FLIES IN A RACCOON. J. Wildl. Mgt. 19(4): 499. Oct. 1955.

A weak raccoon from e. Md. had thousands of larvae of Phaenicia sericata tunneling in and out of the skin and subcutaneous tissue in the region of the left hind leg and hip. Underlying muscle appeared healthy. Tissue studies gave no explanation of the weakness other than the fly larvae.

MAMMALS--MUSTELIDS

Bolin, F. M., Jenny Turn, S. H. Richards, and D. F. Eveleth. (N. Dak. Agr. Exp. Sta., Fargo.) LISTERIOSIS OF A SKUNK. Bimonthly Bul., N. Dak. Agr. Exp. Sta. 18(2): 49-50, illus. Nov.-Dec. 1955.

First record of this disease of domestic animals in a skunk. The disease causes an encephalitis, as does rabies, so differential diagnosis may be important.

Cowan, I. McT. (U. of B. C., Vancouver.) AN INSTANCE OF SCABIES IN THE MARTEN (MARTES AMERICANA). J. Wildl. Mgt. 19(4): 499. Oct. 1955.

The mite Listrophorus mustelae (Megnin) is reported as a pathogen on the marten (Martes americana) in B. C.--I. McT. Cowan.

Ryder, Richard A. (U. Mich.) FISH PREDATION BY THE OTTER IN MICHIGAN. J. Wildl. Mgt. 19(4): 497-498. Oct. 1955.

Spring foods were studied from 54 stomachs, nearly half of them from trout waters. Food items are listed in detail. They were mainly fishes, crayfishes, and amphibians. Fishes eaten are, in general, of common, slow types. Otter may benefit trout by removing competitive species. "On any but the smallest of streams or trout ponds, the depredations of the otter seem to be insignificant even when a maximum population density of otter is attained." Status of otter in Mich. may well be left as it is, with population level of otter interacting with trapping pressure to yield a tolerable balance.

Stullken, Donald E., and Charles M. Kirkpatrick. (CNATRA Staff, NAS, Pensacola, Fla.) PHYSIOLOGICAL INVESTIGATION OF CAPTIVITY MORTALITY IN THE SEA OTTER (ENHYDRA LUTRIS). Trans. 20th N. A. Wildl. Conf. p. 476-494. 1955.

Based on study at Amchitka Is., Alaska, Feb.-Mar. 1954. 22 sea otters were studied: 7 normal, 12 that died in captivity, 3 that survived. Necropsies were performed and tests were made for blood components, liver glycogen, tissue moisture, organ weights, gastro-enteritic activity, and histological structure. Observations were made on living animals for temperature regulation, breathing, and heart rate. Normal values were established for RBC, WBC, and eosinophil counts; hemoglobin concentration; blood sugar; liver glycogen concentration; tissue moisture; organ weights; body temperature; heart rate; and breathing rate and pattern. Animals that died in captivity had severe gastro-enteritis, distinct eosinopenia, vasodilation, and a slight hemoconcentration and tissue moisture content. The captive sea otter requires food equal to 25-35% of body weight per day. Food passes through alimentary canal in about three hours. Temperature tolerance of sea otter seems limited. Captivity mortality in sea otters probably is due to an acute stress or shock reaction. This is characterized by a rapidly developing gastro-enteritis precipitated by insufficient food, intolerable environmental temperatures, and adverse sensory stimuli.--D. E. Stullken.

MAMMALS—DOGS, WOLVES, FOXES

Keener, John M. (Wis. Cons. Dept., Rhinelander.) THE CASE FOR THE TIMBER WOLF. Wis. Cons. Bul. 20(11): 22-24, illus. Nov. 1955.
Fewer than 50 wolves probably remain in Wis. and their numbers and range are still shrinking. The wolves do no harm with their deer killing, for deer populations in wolf range are some of the highest in state; actually, the deer killing helps slow up overpopulation. Some private forest owners encourage predators in an endeavor to keep down forest-damaging herbivores. Wolves in Wis. are not livestock killers to any great extent, for there are few livestock in their area. Wolves are not a danger to people; in fact, they are extremely timid under normal circumstances. If the species is to be perpetuated in Wis., the bounty should be lifted and only limited access should be allowed to the public lands that constitute the chief wolf range.

Martin, Frank R. (US F&WS, Foxholm, N. Dak.) RED FOX FOOD HABITS IN THE VICINITY OF A VULNERABLE CAPTIVE GOOSE FLOCK. J. Wildl. Mgt. 19(4): 496-497. Oct. 1955.
An observation on a red fox in a 22-acre goose pen holding 82 pinioned Canada Geese. Tracking on fresh snow revealed that the fox fed on mice after exhibiting interest in a very vulnerable flock of geese. There was no indication that the fox tried to attack the geese or that the geese were alarmed.- F. R. Martin.

MAMMALS—BIG GAME—GENERAL

Banfield, A. W. F., D. R. Flook, J. P. Kelsall, and A. G. Loughrey. (Can. Wildl. Serv., Ottawa.) AN AERIAL SURVEY TECHNIQUE FOR NORTHERN BIG GAME. Trans. 20th N. A. Wildl. Conf. p. 519-532, graph. 1955.
Aerial survey has proved to be the only practical method of obtaining data on big game populations, herd composition, and annual increment in wilderness areas of n. Can. Different big game species require different handling of data. Moose population data are best treated as trends. Caribou populations are best surveyed in early spring and are best segregated into herds for study. White sheep and walrus may be censused as herds in discontinuous habitats. Musk-oxen are more easily counted in summer along margins of lakes and rivers. The following technique is best suited to varied northern conditions: Individual angles of sight to animals observed and altitude are recorded. The effective transect width may be obtained by grouping the distances to the animals in standard intervals. Outer and inner intervals may be discarded when scarcity of records indicates low efficiency of observation. Low oblique aerial photographs are used extensively to obtain segregation data, by examining them under binocular microscope or stereoscope.—Authors.

Lloyd, Russell Duane. (Utah St. Agr. Coll.) BIG GAME MEAT CONSUMPTION IN UTAH AND ITS RELATION TO CONSUMPTION OF MEAT FROM COMMERCIAL LIVESTOCK. J. Range Mgt. 8(5): 214-217, graphs. Sept. 1955.
Summary: "From published statistics of Utah's big game harvest the total live weight harvest of elk and deer was computed for the years 1939 to 1954 inclusive. Total weights of edible meat yielded and the per capita consumption of big game meats were computed. These consumption figures, which varied from 6 pounds per person in 1939 to 13 pounds per person in 1951, were compared with national per capita consumption of beef, pork, veal, and lamb and mutton from 1939 to 1952 inclusive. Factors affecting the harvest, distribution, and consumption of big game were discussed briefly. It is estimated that, over the long-run, per capita consumption of big game in Utah will decline due to limited game herds and growing human population." For almost all of the period considered, elk and deer meat were consumed at a greater rate than lamb and mutton; after 1949, consumption of elk and deer outstripped even that of veal.

Wyoming. WYOMING'S BIG GAME ANIMALS. Rev. ed. Wyo. Game & Fish Comm. 1-19 p., illus. Jan. 1955.
Popular pamphlet that has identification chart, photographs, section on natural history and hunting of each species, and kill records for each species for last 10 years. Includes practical information for prospective hunters.

MAMMALS--HOOFED (Except Odocoileus)

Anonymous. SET SPECIAL SEASON ON BARBARY SHEEP. New Mexico Mag. 33(11): 31-33, illus. Nov. 1955.

Barbary sheep, aoudad, or arui [Ammotragus lervia (Pallas)] were introduced into the Canadian River Canyon of N. M. by the state game dept. in 1950. This truly wild herd now numbers about 200. Some 25 rams are to be shot in a special hunt to be held in early Dec. 1955 about 10 mi. nw. of Mills, N. M. The habitat (photos) is rough, rocky, and desertine, much like the N. African home of these sheep. Hunting will be difficult, partly because of terrain, partly because these sheep are masters of concealment. [This animal is a true sheep. Formerly in the genus Ovis, it is now in the next genus to it. Presence of a wild herd of this sheep in the U. S. has been noted in "Inventory of big-game animals of the United States," but it has not even been mentioned in the Burt or Palmer field guides or in the Miller-Kellogg checklist. Introduction of the blackbuck (see WR 82: 22) has been almost completely ignored.]

Buechner, Helmut K., and Carl V. Swanson. (St. Coll. Wash.) INCREASED NATALITY RESULTING FROM LOWERED POPULATION DENSITY AMONG ELK IN SOUTHEASTERN WASHINGTON. Trans. 20th N. A. Wildl. Conf. p. 560-567, graph. 1955.

Evidence from embryos and lactation show more than 50% pregancies among yearlings as compared with 7-17% in other natural populations from which data are available, indicating increased natality resulting from lowered density brought about by hunting. Harvest and age-composition data indicate a young, vigorously increasing population. Presuming nutrition to be the principal underlying factor responsible for increased natality, it is significant that the vegetation has not changed appreciably in recent years. Apparently the increased natality reflects better nutrition through greater availability of forage per individual rather than improvement in condition of vegetation.--H. K. Buechner.

Harper, Francis. THE BARREN GROUND CARIBOU OF KEEWATIN. U. Kans., Mus. Nat. Hist., Misc. Publ. no. 6. 1-163 p., 29 figs. Oct. 1955. $1.50, paper, from Arctic Inst. of N. Am., 1530 P St. NW., Wash. 5, D. C.

Here is a record of field and library research by a man who is one of the outstanding naturalists of our time and a superlative bibliographer. In 1947 he spent 6 months at Nueltin Lake, sw. Keewatin, Can. His own observations and those of trusted local people are combined in this book with information from museum specimens and a great body of literature. Migrations and factors affecting them are discussed at length. Distributional records are detailed. Ecology is taken up under numerous headings such as influence of food on distribution, destruction and utilization by man, relations to wolves and bears, relations to flies, and effects of reindeer introductions on caribou. "General Habits" includes sections on daily activity periods, herd organization, disposition, tracks and gaits, swimming, signaling, foods, reproduction, growth, antlers, etc. "Morphology and Taxonomy" includes information on geographic variation, measurements, pelages, foot-glands, and fat. The list of literature cited is 15 pages long and lists of references on special topics are scattered through the text. The most striking bibliographic feature, however, is a 26-page section, "Annotated Bibliographical References to Rangifer arcticus arcticus." There each reference is indexed and abstracted for data on caribou. Unfortunately, this book was written before Banfield's major work (1954) appeared. Like Banfield, Harper tells of the incredibly wasteful slaughter by natives. Harper's comments on benefits derived by caribou herds from wolf predation, and his summary of evidence on evils of reindeer introductions, are also of special interest to conservationists.

Kelsall, John P. (Yellowknife, N.W.T., Canada.) BARREN-GROUND CARIBOU MOVEMENTS IN THE CANADIAN ARCTIC. Trans. 20th N. A. Wildl. Conf. p. 551-560, map. 1955.

Numbers, movements and distribution of barren-ground caribou, Rangifer arcticus arcticus, have been studied for 6 years in a 200,000 sq. mi. area in the Western Canadian Arctic. Variation in movement and distribution, and a progressive reduction in numbers on one study range are described. Evidence of movement of caribou from one range to another far distant, and of mingling and intermovement of caribou from geographically distinct ranges, is presented. The relation of the described phenomena to management is discussed.--J. P. Kelsall.

MAMMALS--HOOFED (Except Odocoileus)--Continued

Lentfer, Jack W. (Livingston, Mont.) A TWO-YEAR STUDY OF THE ROCKY MOUNTAIN GOAT IN THE CRAZY MOUNTAINS, MONTANA. J. Wildl. Mgt. 19(4): 417-429, 3 figs. Oct. 1955.

An introduced herd was studied in the Crazy Mtns., sw. Mont., from Mar. 1952, 11 years after introduction, to Oct. 1953. Comparisons were made between Crazy Mtns. goats and goats from the herd that supplied the original stock. Population data were secured by aerial and ground censuses; methods are described and compared. Parturition period, kid-adult ratios, and numbers of single kids, twins, and triplets are discussed. Examination for presence of sperm in males and corpora lutea in females gave information on time of breeding. Live-trapped and dead animals were examined to obtain data on dentition, weights, body measurements, and horns. Each is evaluated as a criterion for estimating age. Seasonal movements are described. Distribution of animals from original release site is delimited. Live-trapped goats were marked and released for movement studies. Effectiveness of marking is discussed. Two observations on longevity are recorded. Other observations of activities and behavior, pelage, moisture requirements, and adverse factors are described.--J. W. Lentfer.

Rieck, W. (Inst. Jagdkunde, Hann.-Münden, Germany.) DIE SETZZEIT BEI REH-, ROT- UND DAMWILD IN MITTELEUROPA. Z. Jagdwissensch. 1(2): 69-75, graphs. 1955.

Has English summary. Detailed consideration of time of birth of red, roe, and fallow deer in Germany as determined from dates on which hundreds of fawns were marked. Geographic variation in birth dates of roe deer is discussed.

Riney, Thane A. (N. Z. Forest Serv., P. O. Box 894, Wellington, N. Z.) ANTLER GROWTH AND SHEDDING IN A CAPTIVE GROUP OF FALLOW DEER (DAMA DAMA) IN NEW ZEALAND. Trans. Roy. Soc. N. Z. 82(2): 569-578. 1954.

Saunders, Jack K., Jr. (Cornell U.) FOOD HABITS AND RANGE USE OF THE ROCKY MOUNTAIN GOAT IN THE CRAZY MOUNTAINS, MONTANA. J. Wildl. Mgt. 19(4): 429-437, 1 fig. Oct. 1955.

An investigation of food habits and range use of an introduced herd was conducted in the Crazy Mtns., Mont., 1952-1953. A general description of vegetative types inhabited by goats is given. Time of day when feeding animals were observed and seasonal utilization of feeding areas are discussed. Information is included on age at which young goats begin grazing. Several methods of studying food habits are reviewed and the procedure used for stomach analysis is described. Observations of use of plants on summer feeding areas and the analyses of 27 stomach samples collected throughout the year are considered in the food habits evaluation.--J. K. Saunders, Jr.

Schmid, F. J. (Peraustr. 36, Villach, Austria.) ERFAHRUNGEN IN DER FREIEN WILDBAHN MIT DER VOGT'SCHEN ERNAHRUNGSHEGE AUF GRUND DER SCHNEEBERGER VERSUCHE. Z. Jagdwissensch. 1(2): 56-59. 1955.

Has English summary. Concise account of work in producing artificial feeds for red and roe deer. Amounts of this feed required by red and roe deer, and growths attained on it, are outlined.

Ueckermann, E. (Techn. Zentralstelle des Forstwesens, Am Höpen 149, Meckelfeld b. Hamburg, Germany.) EIN ERKLÄRUNGSVERSUCH DER BEI ROTWILD IN WESTDEUTSCHLAND ANZUTREFFENDEN UNTERSCHIEDE IM KÖRPERGEWICHT. Z. Jagdwissensch. 1(2): 92-98, 4 figs. 1955.

Has English summary. Explanations given by Beninde for local variations in weight of red deer are not considered satisfactory. In particular, the browse factor was not studied sufficiently. Therefore, av. weights of red deer in 33 forestry districts of W. Germany were studied in connection with habitat conditions. No correlation could be found "within larger areas." Author concludes that weight differences may be attributed to genetic differences between now-isolated populations, and that shooting has been at least partly responsible for this genetic variation between populations. He further concludes: 1. A game stock can be upgraded by improved range condition only to a certain limit. 2. Selective shooting may improve stock if good genetic potentialities remain. 3. If genetic tendencies for good trophy heads have been eliminated by hunting, it is necessary to introduce better stock.

MAMMALS--HOOFED (Except Odocoileus)--Continued

Vorreyer, F. (Bad Harzburg, Germany.) DAS KRUCKENWACHSTUM BEIM JUNGEN GAMS. Z. Jagdwissensch. 1(1): 22-28, illus. 1955.
Has English summary. The horns of young chamois (Rupicapra) give a good indication of the trophy quality of mature males. The first 2 age classes are safely recognizable, so young males can be shot selectively to leave those that should develop into good trophy specimens. Directions for making such selections are given for the first 2 age classes.

Wettstein, O. (Löwengasse 25, Vienna, Austria.) VERSUCH EINER NEUEN ART VON WILDMARKIERUNG. Z. Jagdwissensch. 1(2): 65-69. 1955.
Has English summary. A system was devised by which workers in different parts of Austria would mark roe deer fawns for field identification of age classes. In any one year, all cooperators would use the same mark, so age of animal would be known wherever it went. A system of ear cropping and notching was adopted for this purpose. The method is called "pronging" ("Zinken"). It is believed that the same marks can be used over again every 7 years. Marks are described.

MAMMALS--DEER (Odocoileus)

Anonymous. THE INCREASING PROBLEM OF DEER DAMAGE. The Timberman 56(11): 48-51, illus. Sept. 1955.
This is the most forceful and convincing article the reviewer has seen on deer making reforestation impossible. Young pines and cedars cannot get a start on many thousands of acres of commercial timberland in northwestern states. Whether naturally seeded or artificially set out, the trees are browsed to death or dwarfed by deer. Exclosures have shown that deer--not rodents, cattle, climate, or soils--are the cause of the condition. Deer like to winter on south slopes and may be one reason that these slopes have been traditionally hard to reforest. Estimates reported here show that damage amounts to hundreds of thousands of dollars each year. Young conifers are destroyed by deer only when all other vegetation is also being consumed and starvation conditions are approached. Repellent sprays might prove of value, but the only solutions to the problem now known are fencing and herd control. Fencing costs $20 to $50 per acre in 160-acre blocks, but may have to be employed. Herd control by various liberalizations of hunting is strongly indicated.

Dickson, John D., III. (7534 Hardee Dr., S. Miami 43, Fla.) AN ECOLOGICAL STUDY OF THE KEY DEER. Fla. Game & Fresh Water Fish Comm., Tech. Bul. no. 3. v + 104 p., 20 figs. [Dec.] 1955.
Soils, climate, water conditions, and ecology of islands in range of key deer are described. Plant ecology of the various habitats is covered in detail; quantitative data on vegetation account for many of the 43 tables. Measurements of museum specimens of O. v. clavium are presented and comparisons are made with mainland deer. Food habits are reported on basis of observations, signs of browsing, and analysis of pellets. Data are given on antler shedding and time of breeding. Attempts to estimate numbers are described. Numbers are so low that estimates were generally unsuccessful. The total number may lie between 25 and 80. Evidence of reproduction suggests that herd is increasing at present. Management measures recommended are: 1. Continue complete protection. 2. Purchase or lease land as genuine refuge, perhaps on outlying keys to which deer can resort as residential development continues on main keys. 3. Keep open areas scattered through pineland and hammocks by means of fire and bulldozing. 4. Determine range capacity of the deer as herd builds up and remove excess deer. 5. Restrict dogs as this becomes necessary with increased settlement. Fortunately, local sentiment seems to favor the deer and there is no sign of forage lack at present level of deer population. The frequent fires are considered favorable rather than harmful to deer. Only apparent reason for current low population is simply overhunting; this factor long ago eliminated deer from many keys.

MAMMALS--DEER (Odocoileus)--Continued

Graham, Samuel A., and Casey E. Westell, Jr. (U. Mich.) QUANTITIES OF DEER BROWSE PRODUCED ON RECENTLY CUTOVER ASPEN LAND. Mich. Wildl. no. 1. 2 p. Sept. 1955.

Data on browse production of big-tooth aspen suckers under different intensities of clipping. Sucker stands yield great amounts of deer food that is well utilized, especially in late winter, spring, and early summer. Young suckers may die from being broken off too far down the stem. Overpopulations of deer can destroy sucker stands in this way. The result is open land covered with grasses and herbs.

Hadlow, W. J. (Rocky Mtn. Lab., Hamilton, Mont.) DEGENERATIVE MYOPATHY IN A WHITE-TAILED DEER, ODOCOILEUS VIRGINIANUS. Cornell Vet. 45(4): 538-547, illus. Oct. 1955.

Hanson, William R., and Clay Y. McCulloch. (Ariz. Game Dept.) FACTORS INFLUENCING MULE DEER ON ARIZONA BRUSHLANDS. Trans. 20th N. A. Wildl. Conf. p. 568-588, graphs. 1955.

A general ecological study, lasting 2.5 years, was made to determine limiting factors so that proper management could be applied. Palatable species furnish only a small part of the total shrub cover. Food is the limiting factor in many areas and water is in some areas. Carrying capacity fluctuates sharply because of frequent severe droughts. Too heavy browsing by deer and cattle is causing succession to a lower carrying capacity. Numbers of deer or cattle or both should be reduced, watering sites increased, and experiments with brush control continued. The paper includes data on local movements, population density, sex ratios, productivity, and causes of mortality.--W. R. Hanson.

Harlow, Richard F. (Fla. Game Comm.) PRELIMINARY REPORT ON A DEER BROWSE CENSUS BASED ON 100% CLIPPING METHOD. 9th Ann. Meeting, SE. Assn. Game & Fish Comm's. 1-47 p., proc. Oct. 1955.

A long, detailed, quantitative report on forage conditions in various areas and habitats of Fla. Some areas studied were deer enclosures, others represented a variety of ecological situations and land uses. Reported for each significant forage species in each area are av. lbs. per acre, av. utilization by deer or cattle, and percent frequency of occurrence. Techniques used in this 100% clipping method, and in determining percentage of utilization, are described. They should be of considerable interest to others making detailed forage studies.

Hildebrand, Milton. (U. Calif., Davis.) SKELETAL DIFFERENCES BETWEEN DEER, SHEEP, AND GOATS. Calif. Fish & Game 41(4): 327-346, illus. Oct. 1955.

It is often desirable for law enforcement and other purposes to be able to identify bones accurately despite having little comparative material. "This paper describes diagnostic features of 12 bones from limbs, girdles, and spine which nearly always permit certain discrimination of deer from these domestic animals, and often set sheep apart from goats." Some differences are qualitative. Many others are expressed as ratios. "Individual variation is striking and many species differences can be expressed only as variations in the average form of characters for which extreme values overlap. Statistical analysis is therefore desirable to establish the reliability of determinations. By calculating the significance of the product of several independent probabilities it is often possible to combine relatively small odds to establish reasonably certain identifications. The method is described." Author's data are based on study of 10 Odocoileus hemionus columbianus, 8 sheep, and 9 goats. Presumably the results should be applied to eastern deer with some care.

MAMMALS--DEER (Odocoileus)--Continued

Jenkins, James H., Seldon D. Feurt, Frank A. Hayes, and Jack A. Crockford. (U. Ga.) A PRELIMINARY REPORT ON A FIELD METHOD OF CAPTURING DEER USING DRUGS. 9th Ann. Meeting, SE. Assn. Game & Fish Comm's. 1-7 p., proc. Oct. 1955.

Account of experiments in capturing deer by shooting them in hindquarters with doped darts. Curare and flaxedil were not satisfactory. Best drug was strychnine arsenate at dose of 100 or 150 mg., but sulfate and levulinate salts of strychnine were about as good. Drug was made into thick paste with liquid glucose and applied to dart made from 7/64 in. drill bit. Deer were hunted at night, shot with dart, and followed until they were inactivated--8 to 12 minutes. "As soon as the deer falls immediate therapy with pentobarbital sodium (60 mg/cc.) should be begun within 5 minutes. Antidoting must be done symptomatically; i.e., deep enough to nullify muscle tetany but not suppress respiration. Stimulants have been employed when respiratory embarrassment became evident." Animals captured have recovered without complications. Deer that escaped and died from strychine were not poisonous when fed to dogs.

Jensen, Wallace, and W. Leslie Robinette. (Utah Game Dept.) A HIGH REPRODUCTIVE RATE FOR ROCKY MOUNTAIN MULE DEER (ODOCOILEUS H. HEMIONUS). J. Wildl. Mgt. 19(4): 503. Oct. 1955.

Thirty pregnancy examinations of mule deer does from a herd summering in Idaho and wintering in Utah revealed a fetal rate of 1.84 per doe older than fawns. One of 5 fawns was pregnant. The writers suspect that the wide choice and abundance of good forage are responsible for the productiveness of this herd.--W. L. Robinette.

Lueth, Francis X. (Ala. Dept. Cons.) THE BIRTH DATES OF ALABAMA DEER. 9th Ann. Meeting, SE. Assn. Game & Fish Comm's. 1-7 p., graphs, proc. Oct. 1955.

A large amount of data of various types indicates that Ala. whitetails are born from May to Dec. Most births occur July-Sept., with peak in Aug.

Mikula, Edward J. (Mich. Dept. Cons., Shingleton.) AN EFFICIENT HANDLING CRATE FOR WHITETAIL DEER. J. Wildl. Mgt. 19(4): 501-502, 1 fig. Oct. 1955.

Handling large numbers of wild deer has necessitated development of a crate to facilitate rapid handling and reduce injuries. Mechanical drawings of crate are provided. An end door with a padded hole and an insertable pry door are used to immobilize animals. Deer up to 200 pounds have been handled with this type crate.--E. J. Mikula.

Neils, George, Lowell Adams, and R. M. Blair. (J. Neils Lumber Co., Libby, Mont.) MANAGEMENT OF WHITE-TAILED DEER AND PONDEROSA PINE. Trans. 20th N. A. Wildl. Conf. p. 539-551, illus. 1955.

Investigations of deer and ponderosa pine in nw. Mont. have shown that deer browsing is a primary limiting factor in pine regeneration. Heavy browsing results from overstocking of deer on winter range. This range roughly coincides with the best pine producing areas. Remedies appear to be herd reduction or fencing. Reduction would mean increasing hunting pressure greatly by such measures as hunting both sexes, longer seasons, adjusting seasons to times favorable to hunting, keeping access roads open during hunting, increasing bag limit, reducing out-of-state license fees, etc. All these might not result in enough hunting pressure. In that event, fencing appears to be a feasible method of locally controlling deer damage. Economics of fences must be determined by forest managers. It would be desirable to do some test fencing to get exact cost data and to test experimental findings.

MAMMALS--DEER (Odocoileus)--Continued

Severinghaus, C. W. (N. Y. State Cons. Dept.) DEER WEIGHTS AS AN INDEX OF RANGE CONDITIONS ON TWO WILDERNESS AREAS IN THE ADIRONDACK REGION. N. Y. Fish & Game J. 2(2): 154-160. July [Nov.] 1955.

Abstract: "Dressed weights of white-tailed deer from two wilderness areas in the central Adirondacks of New York are reported according to sex and age. The deer were killed during a fall following a very mild winter when losses due to starvation were negligible to nonexistent. These weights are compared with those of deer from more accessible areas of the Adirondacks during the same fall, from the Adirondacks during falls following winters when losses due to starvation were moderate to heavy, from Vermont range that had been severely over-browsed but where starvation had not been found, and from the best deer habitat in New York. Based on the weights recorded, deer range conditions on the two wilderness areas are poorer than those in more accessible parts of the Adirondacks. The evidence indicates that adequacy of the food supply during the winter is the critical factor."

Severinghaus, C. W. (N. Y. St. Cons. Dept.) FAWN WEIGHTS IN RELATION TO REGULATIONS FOR TAKING ANTLERLESS DEER. N. Y. Fish & Game J. 2(2): 247. July [Nov.] 1955.

Graph shows dressed weights of Adirondack deer of age classes from fawn on up. Weights of fawns and deer of all other ages overlap grossly. "...the data clearly demonstrate that, where the deer population exceeds the carrying capacity of its range and where the adults average small in size because of competition for an inadequate supply of winter food, the protection of small deer, supposedly fawns, during an open season for antlerless deer would not be advisable."

Severinghaus, C. W. (N. Y. St. Cons. Dept.) SOME OBSERVATIONS ON THE BREEDING BEHAVIOR OF DEER. N. Y. Fish & Game J. 2(2): 239-241. July [Nov.] 1955.

Abstract: "Six instances of fatal attacks on does by bucks during the breeding season among deer held in captivity are reported. The genital tracts of five of the six does were examined. The relationship of ovulation to the peak of the estrus period, when a doe becomes receptive, appears to be quite inconsistent. It seems that does may cause vigorous sexual stimulation in bucks for at least 3 days prior to receptiveness and for at least 2 days after mating. Thus it would appear that an individual doe might attract a buck's continuous and ardent attention for a period of at least 5 or 6 days." In the wild, does escape injury by eluding bucks.

Severinghaus, C. W., and H. F. Maguire. (N. Y. St. Cons. Dept.) USE OF AGE COMPOSITION DATA FOR DETERMINING SEX RATIOS AMONG ADULT DEER. N. Y. Fish & Game J. 2(2): 242-246. July [Nov.] 1955.

Abstract: "...A method of deriving a reasonable approximation of the sex ratio among the adults in a deer population is described. It depends on concurrent random sampling of the adults of each sex, accurate determination of the age of the deer in the samples, and a basis for equating the proportions of males and females among the yearlings prior to the time of sampling. Stated briefly, the ratio of the percentages of yearlings in separate samples of the two sexes (corrected for any inequality in the sex ratio among the yearlings) is the inverse of the sex ratio among the adults as a whole."

Shope, Richard E., L. G. MacNamara, and Robert Mangold. (Ridge Rd., Kingston, N. J.) DEER MORTALITY / EPIZOOTIC HEMORRHAGIC DISEASE OF DEER. N. J. Outdoors 6(5): 16-21, illus. Nov. 1955.

Heavy mortality of deer occurred in parts of N. J. in Aug. and Sept. 1955. Several hundred deer probably died before the epizootic subsided in late Sept. Symptoms were rough coat, listless drooping when lying down, wobbliness in walking. Animals that were obviously sick died within a few hours. Autopsy revealed numerous small hemorrhages throughout body. Preliminary laboratory work strongly indicated an undescribed virus as cause and suggested that the disease is specific to deer and that it may prove to be carried by insects rather than being contagious. The following is from an anonymous news note in Outdoor News Bul. 9(24) p. 3: "Meeting in Atlanta, Georgia, on December 19-20

MAMMALS--DEER (Odocoileus)--Continued

[1955] will be wildlife biologists, public health officials and pathologists from several of the States afflicted this year by a sudden die-off of white-tailed deer. The die-offs, which occurred from early August to mid-October, have been reported in New Jersey, Michigan, North Carolina, Georgia, Arkansas, and Tennessee, according to the Wildlife Management Institute. It was impossible, of course, to tally all the deer that succumbed, but it is reported that several hundred died in New Jersey, with lesser numbers in the southern States and Michigan. Die-offs of a similar nature have occurred in some of these areas periodically since 1908. Those planning to attend the Atlanta meeting hope to organize a joint program for studing the malady should it occur again."

MAMMALS--MARINE

Fisher, H. D. (St. Andrews, N. B.) UTILIZATION OF ATLANTIC HARP SEAL POPULATIONS. Trans. 20th N. A. Wildl. Conf. p. 507-518, map. 1955.
Distribution and movements of breeding groups are summarized. Extent and history of kill, economic uses, biological research, and management needs are reviewed. Average annual kill of pups since 1949 (161,000) is slightly in excess of that of the 30-year period previous to World War II. Kill of maturing and breeding seals (68,000) has about doubled. Chief target of the industry is the white-coated pup. Oil, fur and leather are the major products. Aerial photography has provided population estimates of 2,067,000 for coast of Newfoundland, and 1,200,000 for Gulf of St. Lawrence. Reproductive studies and aging by tooth-rings reveal that ♂♂ mature at about 8 years. ♀♀ first ovulate between ages of 5 and 8, with peak at 6. Breeding life extends to over 20 years. No formal laws govern extent of kill of harp seals in Atlantic. There is informal international agreement on opening dates. There is vital need for closing date to protect maturing and breeding stock in the moulting patches. There is also need for the industry to emphasize quality rather than quantity.--H. D. Fisher.

Kenyon, Karl W., and Victor B. Scheffer. (US F&WS.) THE SEALS, SEA-LIONS, AND SEA OTTER OF THE PACIFIC COAST. US F&WS, Cir. 32. 1 + 34 p., illus. Apr. 1955. 20¢ from Superintendent of Documents.
A useful field guide and a good summary of natural history and conservation status. It is a revision of Wildl. Leafl. 344 of same title and authorship. The revision covers all 12 species that occur from Mexico and the Hawaiian Islands n. to Point Barrow and gives more information about each species. It includes a practical field key. Treatment of a typical species includes a paragraph of general information, useful descriptive data, range statement, breeding habits, feeding habits, sketch and photograph of animal, and sketch of skull. It would be fine to have such authoritative, handy booklets for other important animal groups.

Rigdon, R. H., and Glenn A. Drager. (U. Texas Med. Branch, Galveston.) THIAMINE DEFICIENCY IN SEA LIONS (OTARIA CALIFORNIANA) FED ONLY FROZEN FISH. J. Am. Vet. Med. Assn. 127(944): 453-455, illus. Nov. 1955.
Discussion of findings in 3 sea lions that died suddenly, apparently as result of thiamine deficiency. The seals had been fed only fish and cod liver oil.

Taylor, F. H. C., M. Fuginaga, and Ford Wilke. DISTRIBUTION AND FOOD HABITS OF THE FUR SEALS OF THE NORTH PACIFIC OCEAN / REPORT OF COOPERATIVE INVESTIGATIONS BY THE GOVERNMENTS OF CANADA, JAPAN, AND THE UNITED STATES OF AMERICA, FEBRUARY-JULY 1952. US F&WS. x + 86 p., illus. 1955. 50¢ from Supt. Documents. [No copies available from Washington office of F&WS.]
One of the most important and detailed works on fur seals. Text is amplified by numerous tables, graphs, maps, and photographs. Distribution in different areas is considered in connection with time of year, variations from year to year, numbers, age and sex groups, water temperatures, place of origin, and social groups. Food habits and their significance are treated at length for Asian and

MAMMALS--MARINE--Continued

Am. waters. Other subjects covered include: size, growth, pregnancy rate, abundance in various regions, mixing of Asian and Am. populations as shown by tag recoveries, comparisons and interrelationship of Asian and Am. populations (taxonomic and biological), life tables, comparative pregnancy rates, and statistical comparisons of measurements of Asian and Am. seals.

MAMMALS--OTHER GROUPS

Oliver, James A. (N. Y. Zool. Soc.) IS THE MONGOOSE A SNAKE KILLER? Nat. Hist. 64(8): 426-429, illus. Oct. 1955.

Too many people still ask if it wouldn't be a fine idea to introduce mongooses for snake control. Here Oliver shows what an unwilling and inefficient snake killer the mongoose really is and gives a little information on what a pest the mongoose has become in some areas where introduced. The mongoose's fame as the killer of deadly serpents is chiefly a legend. On Trinidad, mongooses are killed and eaten by several kinds of boas, which are nonvenomous.

BIRDS--GENERAL

McAtee, W. L. (3 Davie Circle, Chapel Hill, N. C.) FOLK NAMES OF NEW ENGLAND BIRDS. [Part 1.] Bul. Mass. Aud. Soc. 39(7): 307-316, illus. Oct. 1955.

McAtee has been studying common names of American birds for 40 years and the results are coming out currently in various local bird journals. The present series for New England is "probably the largest excerpt from the work there will ever be." For each species is given a list of names, localities where the names are (or were) used, and probable origins of the names. Part 1, cited above, covers birds from loons through ducks. [It is highly regrettable that McAtee's great work on common names must come out in small, scattered units. Publication of his complete work, "American Bird Names: Their Histories and Meanings," would be an extremely useful service for some foundation or ornithological organization to undertake.]

Wolfson, Albert, editor. RECENT STUDIES IN AVIAN BIOLOGY. Sponsored by Am. Ornith. Union and publ. by U. Ill. Press, Urbana. ix + 479 p., illus. 1955. $7.50.

One of the most important ornithological works of recent years. It consists of 13 review papers by leading experts. The contributions would be worthwhile and significant papers if published separately; together they constitute a book that should be in every working library of ornithology or wildlife. The volume was carefully prepared, rigorously edited, and well produced. Inevitably, perhaps, papers vary in up-to-dateness: dates of manuscript receipt vary from Jan. 1952 to April 1955. The editors are to be commended for publishing these receipt dates; would that this forthright practice were commoner. Each contribution has its own bibliography; most of the bibliographies are lengthy. The volume is indexed. Titles and authors are: Concepts and problems of avian systematics in relation to evolutionary processes, by Alden H. Miller. Recent revisions in classification and their biological significance, by Herbert Friedmann. Paleontology, by Alexander Wetmore. Avian anatomy, 1925-1950, and some suggested problems, by Harvey I. Fisher. The study of behavior in birds, by John T. Emlen, Jr. Bird navigation, by Donald R. Griffin. The annual stimulus for migration: experimental and physiologic aspects, by Donald S. Farner. Direct studies of nocturnal bird migration, by George H. Lowery, Jr., and Robert J. Newman. Breeding biology of birds, by David E. Davis. Recent advances in knowledge concerning the role of hormones in the sex differentiation of birds, by L. V. Domm. Some American population research on gallinaceous birds, by Joseph J. Hickey. Birdbanding in the study of population dynamics, by Donald S. Farner. Diseases of birds, by Carlton M. Herman.

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Arnould-Taylor, W. E., and A. M. Malewski. (Fundamental Research Centre, London.) THE FACTOR OF TOPOGRAPHICAL CUES IN BIRD HOMING EXPERIMENTS. Ecol. 36(4): 641-646, maps. Oct. 1955.
"The results of the experiments of Matthews, Kramer and St. Paul, and Hitchcock, which had been regarded by some investigators as evidence for a special 'sense of direction' in homing birds, have been critically analysed." The authors' review of previous work leads them to place great importance on topographical cues and to take a decidedly skeptical attitude toward experimental work in which they think such cues were not adequately considered.

Davis, David E. (Johns Hopkins School Hygiene, Balt. 5, Md.) BREEDING BIOLOGY OF BIRDS. In Recent Studies in Avian Biology, Albert Wolfson, ed. U. Ill. Press. p. 264-308, 3 figs. 1955.
Important review paper; long bibliography.

Emlen, John T., Jr. (U. Wis.) THE STUDY OF BEHAVIOR IN BIRDS. In Recent Studies in Avian Biology, Albert Wolfson, ed. U. Ill. Press. p. 105-153, 2 figs. 1955.
Important review paper; long bibliography.

Farner, Donald S. (St. Coll. Wash.) THE ANNUAL STIMULUS FOR MIGRATION: EXPERIMENTAL AND PHYSIOLOGIC ASPECTS. In Recent Studies in Avian Biology, Albert Wolfson, ed. U. Ill. Press. p. 198-237, 3 figs. 1955.
Important review paper; long bibliography.

Frings, Hubert, Mable Frings, Beverly Cox, and Lorraine Peissner. (Pa. St. U.) AUDITORY AND VISUAL MECHANISMS IN FOOD-FINDING BEHAVIOR OF THE HERRING GULL. Wilson Bul. 67(3): 155-170, 3 graphs. Sept. 1955.
Important experimental study.

Griffin, Donald R. (Harvard U.) BIRD NAVIGATION. In Recent Studies in Avian Biology, Albert Wolfson, ed. U. Ill. Press. p. 154-197, 8 figs. 1955.
Important review of recent work on avian orientation; long bibliography.

Irving, Laurence. (Arctic Health Res. Center, Anchorage, Alaska.) NOCTURNAL DECLINE IN THE TEMPERATURE OF BIRDS IN COLD WEATHER. Condor 57(6): 362-365. Nov.-Dec. 1955.
"The night-time decline in body temperature was similar to that reported to occur in temperate climates." Anchorage, Alaska.

Lowery, George H., Jr., and Robert J. Newman. (La. St. U.) DIRECT STUDIES OF NOCTURNAL BIRD MIGRATION. In Recent Studies in Avian Biology, Albert Wolfson, ed. U. Ill. Press. p. 238-263, 10 figs. 1955.
Detailed discussion of method and some of its results.

Matthews, G. V. T. (U. Cambridge, Eng.) BIRD NAVIGATION. Cambridge U. Press, Cambridge Monog. Exp. Biol. no. 3. vii + 141 p., 33 figs. 1955. $2.50, cloth.
A critical and comprehensive review and analysis of field and laboratory studies of bird navigation. This readable and interesting little book should be welcomed eagerly by the many biologists who are interested in its subject but have been unable to keep up with the voluminous literature on it, to say nothing of being able to evaluate all the conflicting evidence. Matthews examines the whole field analytically, discards some theories that seemed well grounded in experimental facts, and concludes: "The reality of navigational ability in birds is an established fact. No theory of the physical basis of bird navigation remains in the field except that involving the sun. This the evidence strongly supports, and the only type of sun navigation that fits the observed facts and is satisfactory from the logical point of view is that proposed by the sun-arc hypothesis." The 15-page bibliography is intended to include "every account of experimental work on bird navigation, and every paper setting out an original theoretical contribution."--L. F. Stickel.

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION--Continued

McClure, H. Elliott, and R. Cedeno. (406 Medical General Lab., Tokyo, Japan.) TECHNIQUES FOR TAKING BLOOD SAMPLES FROM LIVING BIRDS. J. Wildl. Mgt. 19(4): 477-478, 2 figs. Oct. 1955.

Blood may be taken from living birds (without permanent injury to them) from the clipped toe nail, the brachial vein, the heart, and the jugular vein. As the jugular vein is large and easily seen in most species, it is the preferred source of blood. Untrained personnel can quickly learn the technique of extending the bird's neck and bleeding from the jugular vein without killing valuable birds.--Authors.

Neville, James Ryan. AN EXPERIMENTAL STUDY OF MAGNETIC FACTORS POSSIBLY CONCERNED WITH BIRD NAVIGATION. Ph. D. thesis, Stanford U. 145 p. 1955. [From long abstract in Dissertation Abstracts 15(10).]

Laboratory experiments with pigeons. Tests of magneto-sensitivity were either negative or inconclusive.

BIRDS--MANUALS, FAUNAS, COMMUNITIES

Beidleman, Richard G. (Colo. A & M Coll.) GUIDE TO THE WINTER BIRDS OF COLORADO. U. Colo. Mus. (Boulder), Leafl. no. 12. 1-62 p., illus. Oct. 1955. $1.00 + 5¢ postage.

The bulk of this booklet is a field guide that has drawings and photographs and gives information on identification by diagnostic characters, habits, and habitats. A series of field keys also aids identification. Other features are suggestions as to how and where to see birds, discussion of good birding spots in Colo., and a list of the meanings of scientific names of birds treated. The booklet should be of great aid and real interest to those learning the birds of Colo. and adjacent areas.

Edwards, Ernest Preston. FINDING BIRDS IN MEXICO. Amherst Publ. Co., Amherst, Va. xix + 100 p., illus. 1955. $1.90 paper, from E. P. Edwards and Co., Box 611, Amherst, Va. [From long, informative review by F. W. Loetscher, Jr., Wilson Bul. 67(3).]

A valuable travel guide with many good features and some drawbacks. See Loetscher's review for description of book.

Fisher, James. BIRD RECOGNITION. Vol. 3. Penguin Books, Baltimore, Md. 159 p., illus. 1955. 85¢. [From review by Wm. H. Drury, Jr., Sci. Monthly 81(6).]

This third of four volumes of Fisher's fine pocket-sized handbook of British birds covers groups from pigeons through swallows, or, in other words, the upland game birds and larger perching birds. Discussion for each species treats recognition, foods, habitat, breeding, distribution, and movements. Illustrations include black and white drawings of the birds, distribution maps for Britain and Ireland, and circular graphs showing occurrence and breeding status in Britain throughout year.

Lowery, George H., Jr. (La. St. U.) LOUISIANA BIRDS. Publ. for La. Wild Life and Fisheries Comm. by La. St. U. Press. xxix + 556 p., illus. 1955. $5.00.

Although designed for the public rather than for professionals, this book is not merely a compilation but the result of much study by Lowery and many others. It is thus popular yet authoritative. It is decidedly popular in being lavishly illustrated in both color and black and white, and with photographs as well as drawings. Each species is depicted at least once, usually in comparison with similar birds. Subspecies are not treated. The text for a species presents, in narrative form, information on identification marks, relative abundance, seasonal occurrence, and often other notes of interest. No effort is made to present life histories of species, or lists of records on which statements are based. Thorough documentation of the text has been avoided for the sake of popularization, but the bibliography brings up to date and broadens that provided in Oberholser's 1938 work on La. birds. In the back of the book, a set

BIRDS--MANUALS, FAUNAS, COMMUNITIES--Continued

of bar graphs shows seasonal distribution of each species in the state as a whole and in the Baton Rouge region, with extreme dates of occurrence indicated. Brief introductory chapters take up La. as a place to see birds, history of La. ornithology, the La. St. U. Mus. of Zool. and its bird work, how to identify birds, feathers and plumages, the bird skeleton, economic value of birds, conservation and wildlife management, attracting birds, and ornithological societies and clubs. The book should serve as an excellent introduction to bird study in La. and it is very reasonably priced if extent of illustration and quality of bookmaking are considered. Beginners, however, might wish to supplement it with a book that gave more natural history.

Smith, Harry R., and Paul W. Parmalee. A DISTRIBUTIONAL CHECK LIST OF THE BIRDS OF ILLINOIS. Ill. St. Mus. (Springfield), Pop. Sci. Ser. 4. 1-62 p. 1955. 25¢.

Status and seasonal occurrence in state; individual records for scarce forms. Based on much cooperation and compilation, and hence has true reference value.

Sprunt, Alexander, Jr. NORTH AMERICAN BIRDS OF PREY. Sponsored by Natl. Aud. Soc. and publ. by Harper & Bros., N. Y. 227 p., illus. 1955. $5.00.

Dr. J. B. May's fine book, "The Hawks of North America," basis of this book, has been altered beyond recognition and owls have been added. Color plates of most species are included; those of hawks are reprinted from May. Unlike May, the present volume has no range maps. Descriptive material has been reduced to the point that some ornithologists consider it inadequate for recognition. The food habits data that was so important in May has been reduced greatly, sometimes to a sentence or two. Added are derivations of technical names and brief paragraphs on nests and eggs. General information on each species is about what can be found in any good bird book; it is not unusually extensive or complete. Subspecies unfortunately are given a great deal of space. Five pages are wasted on screech owl races that cannot be distinguished in the field, and the information given is of an easily available type. Two distinct species are inserted between races of screech owls.. Recognition of 2 races of pygmy owl are based on comparisons with Calif. pygmy owl, which is not even in this book. Errors in spelling of names of birds and authorities are common. The section of Literature Cited is surprisingly brief and weak on recent works. One of the main points of this book is to play down the old idea of "harmful" and "beneficial" species and to show that each species is worthwhile in its own right. The idea is sound; how well it is carried out the reader may judge. The book is intended mainly for educational use, but for this purpose its size, price, and emphasis on subspecies seem prohibitive. A good feature of the book is the appendix by K. D. Morrison, from which one can tell at a glance just what species of birds are protected in each state and province.--C. S. Robbins and W. H. Stickel.

BIRDS--NUMBERS AND NUMBER FLUCTUATIONS

Farner, Donald S. (St. Coll. Wash.) BIRDBANDING IN THE STUDY OF POPULATION DYNAMICS. In Recent Studies in Avian Biology, Albert Wolfson, ed. U. Ill. Press. p. 397-449. 1955.

Important review paper that emphasizes life-table studies of mortality and longevity; long bibliography.

Lack, David. (Ed. Gray Inst., Oxford, Eng.) BRITISH TITS (PARUS SPP.) IN NESTING BOXES. Ardea (Leiden) 43 (1/3): 50-84. 1955.

This important paper on avian population dynamics extends previous work by Kluyver, Lack, and Gibb but is complete in itself. It is based on a cooperative study of reproduction in relation to habitat conditions and food supply. For great and blue tits, which are adapted to broad-leaved woods, some of the conclusions are: Breeding population was higher in habitats where food for young was more plentiful. But food supply for young did not govern annual fluctuations. Time of laying and time of caterpillar abundance were correlated,

BIRDS--NUMBERS AND NUMBER FLUCTUATIONS--Continued

to benefit of young, by spring temperature. Breeding was later in poor habitats. Clutch-size was not directly correlated with food supply. Clutch-size was higher in good than in poor habitats. Clutches tended to be larger in years when caterpillars were more numerous; both these events occurred when breeding began early, i.e., in mild springs. Clutches were a little smaller when populations were high, but this effect was small in any one wood. Nestlings often died, apparently of starvation, only in first broods in conifers (poor habitat) and in second broods in broad-leaved woods. Second broods were commoner and more successful in conifers than in broad-leaved woods. For coal tit, which is adapted to conifer woods, some comparative findings are: Laying began earlier. There was less seasonal reduction in clutch size; caterpillars are common longer in conifers. Also, second broods were commoner.. Local and annual variations in clutch-size were much smaller.

BIRDS--CONTROL, MORTALITY

Johnston, David W. (Mercer U.) MASS BIRD MORTALITY IN GEORGIA, OCTOBER, 1954. Oriole 20(2): 17-26, illus. June 1955.

A cold front forced a great wave of birds southward and low clouds forced low flight. Some birds were killed by flying into towers and buildings but thousands upon thousands became confused by the powerful beams of airport ceilometers and flew into each other, the ground, or nearby obstacles. Birds were in fine condition; injuries and deaths resulted from collisions. The paper tells of findings at various points in Ga. and cites other papers that tell of widespread bird destruction during the same period and conditions.

MacGregor, Wallace G. (Calif. Dept. Game.) CYANIDE POISONING OF SONGBIRDS BY ALMONDS. Condor 57(6): 370. Nov.-Dec. 1955.

Hundreds of goldfinches in Calif. were poisoned by eating almonds at an abandoned orchard; 3000-5000 goldfinches and a few house finches were poisoned by eating almond bits at a shelling plant.--L. F. Stickel.

Mann, Wm. F., Jr., H. J. Derr, and Brooke Meanley. A BIRD REPELLENT FOR LONGLEAF SEEDING. US For. Serv., So. For. Exp. Sta. (New Orleans 13, La.), So. For. Notes no. 99. p. 1-2. Sept. 1955.

Morkit, which contains anthraquinone, is best bird repellent known for treating seed of longleaf pine. Total cost of chemical, sticker, and labor has so far averaged about 15¢ per lb. of seed. The treatment was successful in both 1953 and 1954. 3,050 to 4,500 seedlings per acre were obtained under adverse conditions after sowing about 12,500 seeds (3 lbs.) per acre. Untreated seed gave very poor results. [For more detailed paper on this subject see WR 82: 31.]

BIRDS--PARASITES AND DISEASES

Herman, Carlton M. (Patuxent Refuge, Laurel, Md.) DISEASES OF BIRDS. In Recent Studies in Avian Biology, Albert Wolfson, ed. U. Ill. Press. p. 450-467. 1955.

Important review of work on diseases and parasites of wild birds; long bibliography.

BIRDS--UPLAND GAME--GENERAL

Aldrich, John W., and Allen J. Duvall. (US F&WS.) DISTRIBUTION OF AMERICAN GALLINACEOUS GAME BIRDS. US F&WS, Cir. 34. ii + 30 p., illus. 1955. 30¢ from Superintendent of Documents.

In some ways this is one of the most satisfying publications to come from the F&WS in many a year. From chachalaca to chukar and turkey, the ranges of all 18 species established in N. Am. are mapped thoroughly, with dots and circles for localities represented by specimens or literature records, and with different

BIRDS--UPLAND GAME--GENERAL--Continued

types of shading for ranges of all subspecies. Where past and present distributions differ significantly, 2 maps are provided. Maps are large, clear, and well executed. A statement of habitat is given for each species. Bob Hines' drawings of each species add to the attractiveness of the paper. This bulletin was intended to be as authoritative as possible; to this end the maps and manuscript were sent to each state and provincial game department and to various individuals for criticism. The resulting publication certainly is not above further criticism, but it should be much more dependable and complete than previous efforts of the same sort. Two taxonomic changes that have been suggested by many workers are formally adopted here: Franklin's grouse is treated as a race of spruce grouse, and the lesser prairie chicken is treated as a race of the greater. This booklet is well printed on glossy paper. It is likely that the Government Printing Office has or will have enough copies to meet the large and continuing demand that may be expected.

Hickey, Joseph J. (U. Wis.) SOME AMERICAN POPULATION RESEARCH ON GALLINACEOUS BIRDS. In Recent Studies in Avian Biology, Albert Wolfson, ed. U. Ill. Press. p. 326-396, 3 figs. 1955.
Long, important review paper; extensive bibliography.

BIRDS--QUAIL

Genelly, Richard E. (MVZ, U. Calif., Berkeley.) ANNUAL CYCLE IN A POPULATION OF CALIFORNIA QUAIL. Condor 57(5): 263-285, map & graphs. Sept.-Oct. 1955.
Important and detailed report of 3 years' study of field biology in Contra Costa Co., Calif. Among the topics are: trapping, marking, age determination, courtship, relationship of age to pairing, the pair bond, calling, fighting, defense of mate and young, unmated ♂♂, territoriality, reproductive cycle of ♂♂ and ♀♀, molts, growth of young, and adult weight changes. Good quantitative data are given on most of these subjects and comparisons are made with work on other quail.

Greenwalt, Lynn A. MOBILITY OF GAMBEL'S QUAIL (LOPHORTYX GAMBELI GAMBELI) IN A DESERT-GRASSLAND-OAK-WOODLAND AREA IN SOUTHEASTERN ARIZONA. M. S. thesis, U. Ariz. 37 p., illus. 1955. [Copy in US Dept. Int. Library.]

Haugen, Arnold O. (Ala. Poly. Inst.) ALABAMA QUAIL AND QUAIL HUNTERS. Ala. Cons. 27(2): 4-6, 25, 1 fig. Sept.-Oct. 1955.
Age ratios for 1954-55 are reported for several sections of state. They av. 70% young, a drop of 8% in 1 year. The drop is attributed to drought reducing food and cover. Data are given on distribution of hunting pressure during season.

Haugen, Arnold O. (Ala. Poly. Inst.) RECOGNIZING JUVENILE FROM ADULT BOBWHITE QUAIL. 9th Ann. Meeting, SE. Assn. Game & Fish Comm'rs. 1-5 p., illus., proc. Oct. 1955.
"A total of 7,037 quail wings sent in by cooperators during the 1954-55 hunting season in Alabama, was examined for age ratio data... About 2 to 3 per cent of the wings were atypical with the remainder being quite easily separated into young or old... Atypical wings which can not be aged with certainty by previous methods [which are reviewed here] can be separated into adult and juvenile by observations on the general color density, shape, and sturdiness of structure of greater upper primary covert No. 7 (third from outside)." Details of the process are described.

BIRDS--QUAIL--Continued

Hood, M. Roy. (Miss. Game Comm.) MISSISSIPPI QUAIL INVESTIGATION. 9th Ann. Meeting, SE. Assn. Game & Fish Comm's. 1-18 p., proc. Oct. 1955.
Report of quail studies on Copiah Co. Game Area, a partially wooded tract that is managed for quail by controlled burning, perennial and annual food plantings, and related practices. Population figures are given for 3 habitats, spring and fall, 1950-54. Travel data are tabulated for 142 bobwhites that were trapped, marked, and later recovered; few traveled as much as half a mile. Seasonal availability of different foods is plotted. Ripening dates of seeds of various food plants are tabulated. Winter food habits are reported on basis of 360 quail crops. Hunting statistics are given for the 1954 hunt. Also listed for this hunt are sex and age ratios and av. weights of ♂♂ and ♀♀. Management practices are described briefly, with special attention to burning.

Hungerford, Charles R. (U. Ariz.) A PRELIMINARY EVALUATION OF QUAIL MALARIA IN SOUTHERN ARIZONA IN RELATION TO HABITAT AND QUAIL MORTALITY. Trans. 20th N. A. Wildl. Conf. p. 209-219. 1955.
The blood parasite Haemoproteus lophortyx O'Roke was studied in Gambel's and scaled quail from 1952 to 1954. Populations of quail in low desert, desert grassland and oak-grassland vegetation types were studied. Ninety-four per cent of adult and juvenile Gambel's quail were found to be infected in a sample of 881; 28% of scaled quail were found infected from a sample of 111. Differences in degree of infection on the basis of the number of parasites per 10,000 red blood cells were compared for adults, juveniles and young quail. Infection in wild birds was found to be generally lower than in captive birds. No correlation was found between degree of infection and survival of quail over a one year period under normal weather conditions. The data showed no evidence of any appreciable loss under normal conditions in good habitat, but the high incidence of malarial infection was considered a potential threat during unfavorable circumstances.--C. R. Hungerford.

Rosene, Walter, Jr. (US F&WS, 304 Postoffice Bldg., Gadsden, Ala.) MANAGEMENT TECHNIQUES WHICH ENCOURAGE BOBWHITE QUAIL TO NEST. 9th Ann. Meeting, SE. Assn. Game & Fish Comm's. 1-6 p., proc. Oct. 1955.
Emphasis in quail management recently has been on food. The importance of certain types of nesting cover has been neglected since Stoddard brought it out. In short, unburned grass of the previous year next to bare soil produces the type of edge bobwhite prefer for nesting. Most nests are in unburned grass within 50 feet of such an edge. The author describes effects on quail density of various combinations of good and poor nesting cover with other habitat features. He then tells how to manipulate habitat features to suit bobwhite: how to judge and control tree density, how to get proper thickness of ground cover, and how to arrange for enough of the vital edge between unburned grass and bare soil. Main tools for these purposes are selective cutting, controlled burning, and disking.

Stanford, Jack. (Mo. Cons. Comm.) THE 1955 QUAIL STORY. Mo. Cons. 16(11): 10-11, illus. Nov. 1955.
Three years of severe drought knocked down the number of shootable quail in Mo. but did not create any real scarcity of breeders. With the return of favorable weather in 1955 the drought-denuded earth became covered with annuals that provided quail food. Nesting cover was sufficient. Broods were unusually large, survival was exceptionally good. Author gives figures on these points. Hunting season was lengthened by 15 days.

Tarshis, I. Barry. (Entom. Branch, Camp Detrick, Frederick, Md.) TRANSMISSION OF HAEMOPROTEUS LOPHORTYX O'ROKE OF THE CALIFORNIA QUAIL BY HIPPOBOSCID FLIES OF THE SPECIES STILBOMETOPA IMPRESSA (BIGOT) AND LYNCHIA HIRSUTA FERRIS. Exp. Parasit. 4(5): 464-492, illus. Sept. 1955.
Detailed report of experimental studies.

BIRDS--QUAIL--Continued

Williams, G. R. (N. Z. Wildl. Div.) SOME ASPECTS OF THE LIFE HISTORY AND MANAGEMENT OF CALIFORNIA QUAIL IN NEW ZEALAND. N. Z. Dept. Internal Affairs, Wildl. Publ. no. 36. 1-31 p., illus. 1955.
An attractive pamphlet designed mainly to tell local hunters about the biology and management of this bird. The author's research report on the subject appeared in J. Wildl. Mgt. vol. 16 no. 4. The present paper, with its emphasis on familiar principles and Am. management techniques, is a good piece of work but not indispensable to Am. technical men.

BIRDS--PHEASANTS

Crispens, Charles C., Jr. AN EVALUATION OF THE ADOPTION METHOD OF RING-NECKED PHEASANT PROPAGATION USING PROLACTIN TO INDUCE BROODINESS. M. S. thesis, Ohio St. U. 49 p. 1955.--D. L. Leedy. [Copy to be placed in US Dept. Int. Library.]

Eberhardt, Lee, and Ralph I. Blouch. (Mich. Dept. Cons.) ANALYSIS OF PHEASANT AGE RATIOS. Trans. 20th N. A. Wildl. Conf. p. 357-367, graphs. 1955.
Study of ♂ pheasant age ratios obtained in Mich., 1950-1953, indicates that average values obtained from hunting data are too high. This might result if juveniles are more readily shot than adults. If this is true, age ratios computed from shot samples will be overestimates, with degree of bias decreasing as proportion of population taken increases. Data were obtained from a state-wide mail collection of pheasant wings and legs. Hunting pressure records were obtained from a newspaper questionnaire and a mail survey (1953 only). Mathematical relationships similar to those used by D. B. DeLury are proposed for analysis of age ratio records. Determination of true age ratios seems difficult in view of highly variable data and uncertain sampling. Until practicable and theoretically sound methods for estimating actual age ratios in the population are found, comparisons between years and areas might be made by using age ratios from first day of season if first day hunting effort does not vary greatly between years or areas being compared. A supplementary or alternative procedure for comparisons is available through computation of regression equations. Problems involved in evaluation of age ratios seem to be worthy of much further study since a similar situation probably exists for other species and possibly for sex ratios.--Lee Eberhardt.

Hudson, George E. (St. Coll. Wash.) AN APPARENT HYBRID BETWEEN THE RING-NECKED PHEASANT AND THE BLUE GROUSE. Condor 57(5): 304. Sept.-Oct. 1955.

Hyers, Robert Donald. WINTER FOOD REQUIREMENTS OF PENNED RING-NECKED PHEASANTS AT ORONO, MAINE. M. S. thesis, U. Maine. 59 p., illus. June 1952. [Copy in US Dept. Int. Library.]

Kessler, Francis W. A STUDY OF THE FACTORS AFFECTING THE PRODUCTIVITY OF SEMI-CONFINED PHEASANT POPULATIONS. M. S. thesis, Ohio St. U. 125 p. 1953.--D. L. Leedy. [Copy to be placed in US Dept. Int. Library.]

Klonglan, Eugene D. (Iowa St. Coll.) EFFECTIVENESS OF TWO PHEASANT FLUSHING BARS UNDER IOWA CONDITIONS. Iowa St. Coll. J. Sci. 30(2): 287-294. Nov. 1955.
From summary: "Two types of flushing bars, one employing weights suspended on cables and the other heavy strips of belting to provide the flushing stimulus, were tested for relative effectiveness... There was no difference between...the two bars in light or medium cover, but a pronounced advantage in favor of the cables and weights in heavy cover... Hens that were on a nest when flushed suffered a higher rate of mortality and crippling than hens not on a nest." Data are given on incidence of injuries in different periods of day. "A better flushing bar might result if the cables and weights were placed closer together. Another possibility was placing a belt strip between each cable, thus combining the two bars in effect."

BIRDS--PHEASANTS--Continued

Lauckhart, J. Burton. (Wash. Dept. Game.) IS THE HEN PHEASANT A SACRED COW? Trans. 20th N. A. Wildl. Conf. p. 323-336, 1 fig. 1955.
"In the past it has been assumed that the killing of hen pheasants will reduce the population the following year. This is based on the belief that the birds are not at carrying capacity. However, most available evidence indicates that pheasants as well as all other forms of wildlife maintain their numbers at capacity most of the time. There must be a surplus of hens available almost every year which could be taken without any effect upon populations of subsequent years. They can add materially to the pheasant harvest. It is my opinion that there is no good reason for continuing to maintain the hen pheasant as the 'sacred cow' of North American game birds." A gradual opening of the season on hens is recommended to test effects. The paper consists in large part of significant analyses of the meaning of carrying capacity and its interaction with density-dependent and density-independent factors.

Moore, Paul. (Ohio Div. Wildl.) WILD VS. GAME FARM PHEASANTS. Ohio Cons. Bul. 19(11): 5, 30-31, illus. Nov. 1955.
Ohio data on why stocking doesn't pay. Stocked birds make up only 2-3% of hunter's bag. Stocking has not produced good hunting where there was no natural reproduction. The number of harvestable cocks left at the end of a season is greater than the number stocked. Stocking for the gun during hunting season gives return of 75% of birds, but it is a highly uneconomical business for a state. Costs run closer to $15 than to $5 per pair of birds at most commercial hunting establishments, while a hunting license is only $2.

Muhlbach, Walt. A STUDY OF SEMI-CONFINED PHEASANT POPULATION SUBJECTED TO GENERAL FARMING CONDITIONS. M. S. thesis, Ohio St. U. 245 p. 1954.--D. L. Leedy. [Copy to be placed in US Dept. Int. Library.]

Rosen, Merton N., and William J. Mathey, Jr. (Calif. Dept. Game.) SOME NEW PHEASANT DISEASES IN CALIFORNIA. Trans. 20th N. A. Wildl. Conf. p. 220-228. 1955.
Five recent diseases in Calif. pheasants are described briefly: avian encephalomyelitis, spirochaetosis, Asiatic Newcastle, botulism, and visceral lymphomatosis. The relation between occurrence of diseases and principles of game management is discussed.--M. N. Rosen.

Semones, Vernon D. FURTHER OBSERVATIONS ON THE FACTORS AFFECTING THE BEHAVIOR AND PRODUCTIVITY OF SEMI-CONFINED PHEASANT POPULATIONS. M. S. thesis, Ohio St. U. 103 p. 1955.--D. L. Leedy. [Copy to be placed in US Dept. Int. Library.]

Smith, Rodney. A STUDY OF RING-NECK PHEASANT PROPAGATION UNDER SEMI-NATURAL CONDITIONS. M. S. thesis, Ohio St. U., 70 p. 1953.--D. L. Leedy. [Copy to be placed in US Dept. Int. Library.]

Stewart, Paul A. RESPONSES OF RING-NECKED PHEASANTS TO AUDITORY STIMULI. M. S. thesis, Ohio St. U. 75 p. 1953.--D. L. Leedy. [Copy to be placed in US Dept. Int. Library.]

BIRDS--GROUSE, PARTRIDGE, ETC.

Bendell, James F. (Queen's U., Kingston, Ont.) AGE, BREEDING BEHAVIOR AND MIGRATION OF SOOTY GROUSE, DENDRAGAPUS OBSCURUS FULIGINOSUS (RIDGWAY). Trans. 20th N. A. Wildl. Conf. p. 367-381, graphs. 1955.
Some results of a study made at Quinsam Lake, Vancouver Is., 1950-53. Grouse arrive here between March 6 and April 13. The adults "home." Yearling males do not breed or migrate from their winter range in their first year. The adult males are polygamous and have a territory of the "display and mating station" type. Breeding behavior and migration are related to development of gonads. (Continued on next page.)

BIRDS--GROUSE, PARTRIDGE, ETC.--Continued

Activity of grouse in spring follows a diurnal rhythm regulated by light levels of 2-4 foot candles. Data on ovulation are presented. Eighty per cent of the hatch occurs June 8-28, peak hatch June 15-21. Behavior of broods and fall migration of hens with broods are modified by the weather through its effect on food supply. The fall migration is a dispersal to a relatively large winter range.--J. F. Bendell.

Bendell, James F. (Queen's U., Kingston, Ont.) AGE, MOLT AND WEIGHT CHARACTERISTICS OF BLUE GROUSE. Condor 57(6): 354-361, 2 figs. Nov.-Dec. 1955.
Observations on age groups on Vancouver Is., B. C., with regard to molt timing and pattern, and weights. Age criteria are defined, based on length of outer rectrices and presence of bursa of Fabricius. Sex ratio of 1:1 was found. Young grew 50-60 g. per week June-Sept. but did not reach adult weight until 2d year. Adult weights did not change significantly Apr.-Sept.--L. F. Stickel.

Coats, Jim. (Kans. Game Comm.) RAISING LESSER PRAIRIE CHICKENS IN CAPTIVITY. Kans. Fish & Game 13(2): 16-20, illus. Oct. 1955.
After 3.5 years of work and experimentation, the author makes recommendations about types of pens, mating, incubation, food, and feeding methods.

Farmes, Robert E. (Minn. Div. Game.) A NEW TIP-TOP TRAP FOR TAKING PRAIRIE GROUSE. Flicker 27(3): 123-125, illus. Sept. 1955.
Many types of traps were tried for sharp-tailed grouse in Minn. Description, photographs, and mechanical drawing are given here for the kind that proved best. It is a sunken box the top of which consists of 4 treadles that tip toward the center. A few results of trapping and marking grouse are given. Attempts to establish the species at the Whitewater Refuge in Minn. were not successful.

Höglund, N., and K. Borg. (Trädjardsgatan 22, Söderhamn, Sweden.) ÜBER DIE GRÜNDE FÜR DIE FREQUENZVARIATION BEIM AUERWILD. Z. Jagdwissensch. 1(2): 59-63. 1955.
Has English summary. Causes of population fluctuations in tetraonids, especially capercaillie, are considered. Long-distance migrations of this species are doubted. Mortality is attributed partly to toxoplasmosis, partly to effect of unfavorable weather on chicks. Chill may cause chicks to keep seeking warmth of mother so much that they do not feed enough and hence die of malnutrition.

Janson, Reuel. (S. Dak. Dept. Game.) PRAIRIE GROUSE HUNTING / PAST, PRESENT, FUTURE. S. Dak. Cons. Dig. 22(10): 8-9. Oct. 1955.
Hunting statistics, figures on grouse per square mile, and brood counts are reported for S. Dak. for the last 7-8 years. They all show that prairie grouse really were down in 1955. The author believes that warm, dry weather is not favorable to reproduction of prairie grouse and that best success has been in relatively wet summers. Also, disastrous declines occurred during the drought periods of 1910-11, 1925-27, and 1934-37.

BIRDS--TURKEY

Mosby, Henry S. (Va. Poly. Inst.) THE WILD TURKEY IN VIRGINIA. Va. Comm. Game & Inland Fisheries, Ed. Leafl. no. 12. 8 unnumbered p., illus. 1955.
Reprint from Va. Wildl. for June 1955. See WR 81: 47 for abstract.

Taber, Wendell. (3 Mercer Circle, Cambridge, Mass.) NOTES ON BEHAVIOR OF THE WILD TURKEY. Wilson Bul. 67(3): 213. Sept. 1955.
Swimming by young; running posture of adults.

BIRDS--DOVES AND PIGEONS

MacGregor, Wallace G., and Walton M. Smith. (Calif. Dept. Game.) NESTING AND REPRODUCTION OF THE BAND-TAILED PIGEON IN CALIFORNIA. Calif. Fish & Game 41(4): 315-326, illus. Oct. 1955.

Summary: "A nesting study of band-tailed pigeons was conducted in the Carmel area of Monterey County, California, from 1952 into 1955. A total of 26 nests was observed, all in tree locations. In all but one nest, clutch size was one egg. Nesting occurred as early as February and as late as October. Observations on a single pair of birds revealed three broods successfully fledged during the 1954 nesting season." Age ratios ranging up to 2 young per adult suggest that pairs ordinarily produce more than the 1 young per year generally attributed to this species. Nesting sites are described. Observed nesting success was 65%. Incubation period averaged 19 days. Males help incubate eggs and feed young. Data are given on growth of young and on proper timing of hunting season in Calif.

Mackey, James P. SOME ASPECTS OF MOURNING DOVE BEHAVIOR RELATED TO REPRODUCTION. M. S. thesis, Ohio St. U. 101 p. 1954.--D. L. Leedy. [Copy to be placed in US Dept. Int. Library.]

Peters, Harold S. (US F&WS, Peachtree 7th Bldg., Atlanta 5, Ga.) PRESENT STATUS OF MOURNING DOVE INVESTIGATIONS. 9th Ann. Meeting, SE. Assn. Game & Fish Comm's. 1-3 p., proc. Oct. 1955.

The SE. Dove Study resulted in recommendations for annual call counts, random road counts, continued banding, and bag checks. Forty-four states are making call counts. Few states are making random road counts, although these can be made incidental to other work. Several states are still banding, but banding has declined alarmingly and there is still great need for it in determining dove flyways. No uniform or widespread bag checks are being made; such checks are important and should be standardized, especially since we should be measuring effects of liberalized hunting. No state has a full-time dove biologist and the US F&WS has only one. This lack of support for dove work is incredible when it is realized that as many doves are killed in 29 states as there are waterfowl killed in the whole U. S.

Russell, Dan M. (Ky. Dept. Wildl. Resources.) DO WE REALLY SHOOT MIGRANT DOVES? 9th Ann. Meeting, SE. Assn. Game & Fish Comm's. 1-11 p., proc. Oct. 1955.

Recovery data for banded doves in several states are tabulated and analyzed. "In states where dove hunting occurred, North or South, whether in September or on through February, over 75% of the total direct recoveries were made within the state banded... In the southern dove hunting states, less than 20% of the returns were from outside of the state banded, whether recovered in September or through February. Would this mean that at least 80% of the shootable population would be of home-grown stock irrespective of the dates of the season?" If these suggestions prove correct, and dove hunting states are dependent largely on their own production, these states will have to take more responsibility for adjusting the kill to population level and breeding success.'

BIRDS--WATERFOWL

Beckwith, Stephen L., and H. Jay Hosford. (U. Fla., Gainesville.) THE FLORIDA DUCK IN THE VICINITY OF LAKE OKEECHOBEE, GLADES COUNTY, FLORIDA. 9th Ann. Meeting, SE. Assn. Game & Fish Comm's. 1-26 p., graphs, proc. Oct. 1955.

Report of a partial life history study in which food habits were emphasized. Contents of 144 gizzards collected throughout year are reported in great detail in several tables. Other topics upon which original data are supplied are: weights, av. length and wingspread, color differences between sexes, seasonal changes in size of flocks, dates of mating and nesting, nature of nests and nest sites, clutch size, growth of a brood to 27 days, occurrence of post-nuptial molt, and age determination. The bird is thought to be holding its own or increasing despite an annual kill of perhaps 50-60%. Its adaptability is suggested by the fact that 3 of the 5 nests found during this study were in tomato fields and another was in an old watermelon field.

BIRDS--WATERFOWL--Continued

Beshears, W. Walter, Jr. (Ala. Dept. Cons.) ALABAMA WATERFOWL HABITAT INVESTIGATION. Ala. Dept. Cons., Final Rep. Fed. Aid Project W-30-R. iv + 194 p., illus. + 11 p. insert, "List of Plants," in endpocket. Processed. Mar. 1955.

This is a well-prepared county-by-county analysis of water bodies in the state, indicating their area, location, fluctuation, turbidity, food resources, extent of use by waterfowl, hunting pressure, and related information. The report includes good chapters on programs of waterfowl habitat development for Ala. and other states. The insert, "List of Plants," gives names of 67 desirable and 67 undesirable plants or plant groups.--A. C. Martin.

Clark, Clarence F. (Ohio Div. Wildl.) OBSERVATIONS ON WATERFOWL AT LAKE ST. MARYS, OHIO, AND VICINITY. Ohio Div. Wildl., Tech. Bul. no. 2. iii + 29 p., illus. 1955.

St. Marys, with its 11,000 to 15,000 acres, probably is the largest lake within Ohio. Created artificially over a century ago, it had many years as a cold, clear lake with an abundance of aquatic plants and dead timber both standing and floating. Waterfowl teemed and were killed by thousands each year. Around the turn of the century, oil pollution began, soil erosion became serious, forests were removed, carp took over the lake, and human activity began to dominate all the borders. Now the lake is warm, turbid, shallow and has only a scattering of desirable water plants. There are pressures for recreational developments that will make the lake even less attractive to waterfowl. The author has had 15 years of experience with waterfowl of St. Marys and he has drawn heavily on published records and recollections of old timers. He discusses the history of the lake and then takes up the waterfowl species by species, telling of past and present status, breeding records if any, times of migration, and periods of peak numbers. Today it seems very odd to read of days in the 1800's when fields were black with wood ducks, whose eggs and young were freely collected for human consumption.

Cooch, Graham. (Can. Wildl. Serv., Ottawa.) OBSERVATIONS ON THE AUTUMN MIGRATION OF BLUE GEESE. Wilson Bul. 67(3): 171-174, map. Sept. 1955.

Data given here show that blues may migrate long distances southward at high altitudes and not be seen at places where they are expected. Some information is given on route taken in such a flight and on speed of travel.

Cowan, A. B., and C. M. Herman. (Patuxent Refuge, Laurel, Md.) WINTER LOSSES OF CANADA GEESE AT PEA ISLAND, NORTH CAROLINA. 9th Ann. Meeting, SE. Assn. Game & Fish Comm's. 1-7 p., proc. Oct. 1955.

Report of research and findings to date. Topics discussed include: studies on life history and biology of gizzard worm; results of autopsies; experiments on survival and transmission of gizzard worm eggs and larvae in both field and laboratory; persistence of infections; and results of infections in geese of different ages. Cause of deaths has not been finally determined, but indications are that gizzard worm is an important contributing factor and that poor physical condition, brought about at least partially by malnutrition, also contributes to the losses.

Delacour, Jean. THE WATERFOWL OF THE WORLD. Vol. 1. Country Life Ltd., London. 284 p., 16 color plates by Peter Scott, and 33 maps. Sept. 1954. Price 5 guineas. [From review by Alden H. Miller, Condor 57(5).]

Excerpts from Miller's review follow: "This is a magnificently prepared and published book constituting part one of a projected three-volume work on the anseriform birds of the world. ...'the author and illustrator...are beyond question the two men with most knowledge of waterfowl in the world today...' Part one deals with the sub-families Anseranatinae, Anserinae, and Anatinae, thus including such familiar types as tree ducks, swans, geese, shelducks, and steamer ducks... In the treatment of groups and species the approach is that of synthesis and summarization in which opinions are expressed without full documentation. Thus the work is not exhaustive, and should critical users be inclined to reexamine the full basis for decisions, they will have to search

elsewhere among many uncited items. But of course the experience of the author is such as to guarantee well supported conclusions on most issues. The treatment includes keys, brief descriptions of species, synopses of habits, distribution, and most appropriately, matters related to holding waterfowl as captives. Excellent maps are provided and Scott's superb comparative illustrations are an artistic delight as well as useful and accurate guides to identification. Three very informative plates show downy young."

Dzubin, Alex. (Delta Waterfowl Res. Sta.) SOME EVIDENCES OF HOME RANGE IN WATERFOWL. Trans. 20th N. A. Wildl. Conf. p. 278-298, 3 figs. 1955.

Preliminary paper on home ranges of three waterfowl pairs, canvasback, mallard, and bluewing, in pothole habitat of sw. Manitoba. Approximate area of home range was 1300+ acres for canvasback, 700+ for mallard and 250+ for bluewing. Drakes had a larger range than pairs. Home range is defined as the area in which the pair is most active during pre-nesting, nesting, and incubation periods. Territory is protected part of home range. Waiting area is the part of the territory used and defended most consistently by the drake. Paper includes a comparative discussion of territorial behaviour in the 3 species and describes courtship flights, territorial pursuits, nuptial courtship, and attempted "rape". Literature review indicates that intensity of territorial behaviour may vary between species and in different breeding habitats. The concept of home range, as applied to waterfowl on the breeding grounds, seems to interpret observed behaviour.--A. Dzubin.

Elder, William H. (U. Mo.) FLUOROSCOPIC MEASURES OF HUNTING PRESSURE IN EUROPE AND NORTH AMERICA. Trans. 20th N. A. Wildl. Conf. p. 298-322, illus. 1955.

A portable fluoroscope was used to examine 21,000 game birds in the field. Numbers of lead shot found per bird and percentages of each age and sex of each species carrying shot were recorded during 7 years. A straightline relationship was found when the percentage carrying body shot was plotted against relative target size as computed from average weight. Cumulative band recovery rates showed the same high correlation with incidence of body shot and with relative target size. Shooting pressure significantly lower than anticipated from target size was found in coots, old squaws and hen pheasants. Cock pheasants in S. Dak. received the same shooting pressure in 20 days as drake mallards in Miss. flyway in 4 months. British and American geese are subject to approximately the same shooting pressure but Dutch mallards are shot half as hard as ours. Teal were the same on the two continents. Band recovery rates for geese are lower than anticipated from size of bird and the percentage of geese having body shot is much higher than expected from recovery rates. This, plus the high rate of shot-bearing birds having only one shot, is attributable to the great range at which geese are fired upon and their ability to carry on after being hit. Fluoroscopy provides rapid and direct measures of relative shooting pressure on two populations of the same species and the effectiveness of closed seasons.--W. H. Elder.

Ellig, LeRoy J. WATERFOWL RELATIONSHIPS TO GREENFIELDS LAKE, TETON COUNTY, MONTANA. Mont. Fish & Game Dept., Tech. Bul. no. 1. 1-35 p., illus. July 1955.

Valuable detailed report of waterfowl nesting studies in 1951 and 1952. The shallow, 4,100-acre lake and its surroundings are described quantitatively. Data are given on waterfowl migration dates, sex ratios, numbers of territories in various types of vegetation, numbers and locations of active nests, clutch size, hatching success, nest losses and their causes, numbers of broods and their times of appearance, sizes of broods, and hunting statistics. Nineteen species of waterfowl used the lake in migration and 12 species bred there. Data are broken down by species insofar as possible in the paper's 16 tables. Predation caused failure of 69.8% of eggs from nests on land and 3.0% of eggs from nests over water. Striped skunk was main predator. Skunk control by trapping on neck of a peninsula greatly reduced nest losses on peninsula, but egg failures there then increased somewhat. Breeding pairs of waterfowl on lake were estimated at 341 in 1952. 352 broods were observed in 1951 and 382 in 1952. Figures on nests, eggs, and broods are given in detail. Hunting statistics revealed reported crippling loss to be 26% of kill, and that diving ducks composed little of the bag in proportion to their numbers.

BIRDS--WATERFOWL--Continued

Foley, Donald D. (N. Y. St. Cons. Dept.) CERTAIN ASPECTS OF WATERFOWL HUNTING IN NEW YORK AS INDICATED BY BAG-CHECK DATA FOR 1953 AND 1954. N. Y. Fish & Game J. 2(2): 205-219, map. July [Nov.] 1955.

Black duck was most important duck in state as whole. Hunting success averaged 1 bird per 4-5 gun-hours. Crippling loss was about 25%, but there was evidence that many cripples were recovered by other hunters. Dogs and blinds were aids to success. Hunting success on Long Island was increased substantially as a result of the later open season provided by the separate zoning of this region instituted in 1953. Data on sex and age ratios are given. Apparently unreasonable variations that workers have noted in these ratios may be valuable clues in that they may be associated with sub-populations having differential migratory behavior.

Givens, Lawrence S., and Thomas Z. Atkeson. (153 McClean Street, Decatur, Ga.) THE USE OF AGRICULTURAL COVER CROPS IN SOUTHEASTERN WATERFOWL MANAGEMENT. J. Wildl. Mgt. 19(4): 494. Oct. 1955.

Agricultural cover crops or fall planted annuals have an important place in southeastern waterfowl management. Small grains, ryegrass, and legumes including crimson clover, Austrian peas and button clover are used. Vetches, lupines and others receive little or no use by waterfowl. For best usage, planting dates are important. Consult nearest Agr. Exp. Sta. for recommendations on cultural practices.--Authors.

Herman, C. M., J. H. Steenis, and E. E. Wehr. (Patuxent Refuge, Laurel, Md.) CAUSES OF WINTER LOSSES AMONG CANADA GEESE. Trans. 20th N. A. Wildl. Conf. p. 161-165. 1955.

Reviews losses at Pea Island, N. C. Of 419 birds examined, 1950-1954, 250 were sick or dead. Gizzard worms, occurring in 90% of healthy and 100% of sick birds, though in much greater numbers in the sick birds, were considered along with nutritional factors as important elements in the problem.--C. M. Herman.

Hickey, Joseph J. (U. Wis.) IS THERE SCIENTIFIC BASIS FOR FLYWAY MANAGEMENT? Trans. 20th N. A. Wildl. Conf. p. 126-150, graphs. 1955.

Review of techniques of managing aquatic habitats, control of natural mortality, and hunting kill. Two biological principles underlying the harvest of gallinaceous birds probably apply to waterfowl. The fraction that can be safely harvested is at least one-half of the over-all adult mortality rate for a given species. Mallards banded by DU in the early '40's were apparently harvested in a conservative manner, about 32 per cent being bagged on the average. Overshooting a regional segment of the population probably occurs from time to time. Band-recovery data demonstrate that the smaller ducks could biologically sustain markedly higher rates of hunting mortality which are now roughly proportional to the size of each species as a target. The precise manipulation of harvest rates is a practical possibility for geese but not for ducks.--J. J. Hickey.

Humphrey, Philip Strong. THE RELATIONSHIPS OF THE SEA-DUCKS (TRIBE MERGINI). Ph. D. thesis, U. Mich. 212 p. 1955. [From long abstract in Dissertation Abstracts 15(8).]

Based on study of anatomy and life history data. "The Tribe 'Mergini' of Delacour and Mayr does not appear to be taxonomically valid. The evidence indicates that it consists of at least two unrelated groups of birds, some members of which have independently evolved similar diving adaptations. However, the results of this study support Delacour and Mayr's contentions that the goldeneyes and mergansers are very closely related and that only a single genus of mergansers (Mergus) and a single genus of scoters (Melanitta) should be recognized. Delacour and Mayr advocate recognizing only a single genus of eiders (Somateria); the results of this study indicate that two genera (Somateria and Polysticta) should be recognized."

BIRDS--WATERFOWL--Continued

Hunt, E. G., and A. E. Naylor. (Calif. Dept. Game.) NESTING STUDIES OF DUCKS AND COOTS IN HONEY LAKE VALLEY. Calif. Fish & Game 41(4): 295-314, illus. Oct. 1955.

Based on studies in Lassen Co., Calif. in 1951 and 1953. Topics especially considered were types of nest sites, nesting periods, nesting success, factors affecting nesting success, and brood counts. Data are tabulated by species for both years. Peak of hatch came in June. Nesting success for ducks was 52.5% and 50.1%. For coots it was 95.0% and 97.2%. Predation, chiefly by mammals, was main cause of nest losses; upland nests were much more vulnerable than those out in marsh. Hatching success of eggs in successful nests was 91.7% and 83.9% for ducks and 97.5% and 99.3% for coots. Brood counts showed that an av. of less than 1 duck per brood was lost in first week. The av. coot brood was reduced by 3 during first week. As to nest sites, "Apparently the conditions that prevailed at the nest location, such as concealment and proximity to water, were more important to the nesting ducks than the selection of a certain plant species in which to build a nest. The coot nesting during both studies was confined to areas that grew emergent plant species."

Johnsgard, Paul A. THE RELATION OF WATER LEVEL AND VEGETATIONAL CHANGE TO AVIAN POPULATIONS, PARTICULARLY WATERFOWL. M. S. thesis, St. Coll. Wash. 166 p. 1955.--P. A. Johnsgard.

Kessel, Brina. (U. Alaska.) DISTRIBUTIONAL RECORDS OF WATERFOWL FROM THE INTERIOR OF ALASKA. Condor 57(6): 372-373. Nov.-Dec. 1955.

Summary of interior Alaska records for blue-winged teal, ring-necked duck, and European widgeon.--L. F. Stickel.

Longhurst, William M. (Hopland Field Sta., U. Calif., Hopland, Calif.) ADDITIONAL RECORDS OF "TULE GEESE" FROM SOLANO COUNTY, CALIFORNIA. Condor 57(5): 307-308. Sept.-Oct. 1955.

Notes on habitat, foods, and weights of Anser albifrons gambelli.

McAmis, T. A. (Ark. Game Comm.) WHEREFORE FLYWAY COUNCILS! Trans. 20th N. A. Wildl. Conf. p. 102-106. 1955.

Tells of purposes and functions of flyway councils. Discusses difficulties in cooperation between councils and F&WS and progress that is being made in improving the situation.

Munro, David A., and J. Bernard Gollop. (Can. Wildl. Serv., Ottawa.) CANADA'S PLACE IN FLYWAY MANAGEMENT. Trans. 20th N. A. Wildl. Conf. p. 118-125. 1955.

The need for international management of waterfowl is restated, and some data on distribution of sport ducks are given. Phases of management important in relation to different levels of abundance of waterfowl are indicated, particular reference being made to the problem of waterfowl damage to cereal crops. The importance of basic research and of continuing critical evaluation of techniques for measuring waterfowl populations and harvest is stressed.--D. A. Munro.

Ordal, Norman J. (Minn. Div. Game, Fergus Falls.) PRAIRIE POND--HAVEN FOR WILDLIFE. Cons. Volunteer 18(107): 38-42, illus. Sept.-Oct. 1955.

Productivity of a 12-acre Minn. pothole and 4 smaller, nearby potholes was studied in 1950. At least 20 pairs of ducks of 8 species bred on the area and produced at least 94 young. This pothole was typical, neither good nor bad. As for good ones, the author mentions a 1-acre pothole from which 43 young ducks were trapped, and another of equal size on which at least 51 young ducks of 5 species were observed. Valuable as prairie potholes are for ducks, they also have great values for other game, for fur, and for water holding.

BIRDS--WATERFOWL--Continued

Paynter, E. L. (Saskatchewan Game Branch, Regina.) CROP INSURANCE AGAINST WILDLIFE DEPREDATIONS. Trans. 20th N. A. Wildl. Conf. p. 151-157, 2 figs. 1955.
Farmer interviews in three municipalities indicated that in the years 1950, 1951, and 1952 an average of 32,652 acres of crop were damaged by migratory birds each year resulting in annual losses of $274,632. Big game caused losses in other areas. These extensive losses necessitated the introduction of a wildlife crop insurance plan. Premiums of 5% were paid by farmers and underwritten by funds collected from additional fees charged on hunting licenses. The insurance provided for a maximum coverage of $15.00 per acre. To date 49 policies with a total risk of $55,860 have been taken and claims totaling $11,059.75 have been paid.--E. L. Paynter.

Schierbaum, Donald L., and Donald D. Foley. (N. Y. St. Cons. Dept.) MOVEMENT OF WATERFOWL HUNTERS IN NEW YORK STATE. N. Y. Fish & Game J. 2(2): 232-238, map. July [Nov.] 1955.
Data from bag checks and band returns indicated that over 70% of hunters hunted within 25 miles of home. Few hunters traveled from 1 zone to the other in N. Y. to take advantage of separate opening days.

Smith, Parker B. (Tenn. Game Comm.) WATERFOWL MANAGEMENT ON MULTIPLE-USE RESERVOIRS IN TENNESSEE. 9th Ann. Meeting, SE. Assn. Game & Fish Comm'rs. 1-7 p., proc. Oct. 1955.
Discusses in a rather general way management methods that are being used and problems encountered: difficulties with fluctuating water levels, control of woody plants on mud flats, seeding waterfowl food plants on mud flats, use of subimpoundments or separate ponds for waterfowl foods, use of dewatering areas (areas that are pumped dry for mosquito control during warm season and can then be planted and later allowed to flood), importance of refuges in establishing waterfowl populations. At present, good waterfowl areas in Tenn. are being lost through drainage and others are being gained through new impoundments. "In the last 20 years, waterfowl hunting in Tennessee has increased 488 percent, 104 percent of this being in the ten-year period from 1944 to 1954. Overcrowding of waterfowl hunting areas indicates the need for more hunting land and/or restrictions on hunting methods on public hunting grounds. Steps are being taken in both directions..."

Sowls, Lyle K. (U. Ariz.) PRAIRIE DUCKS / A STUDY OF THEIR BEHAVIOR, ECOLOGY AND MANAGEMENT. Stackpole Co., Harrisburg, Pa. xii + 193 p., 47 figs. 1955. $4.75. [See also review by E. R. Kalmbach, J. Wildl. Mgt. 19(4).]
One of the most important waterfowl publications of recent years. It is chiefly a report of research on 5 species of dabbling ducks on their breeding grounds in s. Manitoba. The study involved time of migration, migrational homing, home range and territoriality, nesting terrain, nesting season and behavior, breeding season mortality, renesting, hen and brood behavior, autumn behavior, and the shooting season. On each subject, the author reports results of research between 1946 and 1950, with some earlier records compiled in 1939 and 1940. He used such techniques as colored bands and markings along with persistent and careful field observation, and he analyzed results for application to management. Sowls has combined careful field work with good writing to give us a concise picture of breeding biology in these ducks. The result sets a high standard for wildlife researchers and merits a "must" classification for waterfowl research men. Users of the book will appreciate the good chapter summaries and the simplicity of writing.--F. H. Dale.

Speake, Daniel W. (Ala. Poly. Inst.) WATERFOWL USE OF CREEKS, BEAVER SWAMPS, AND SMALL IMPOUNDMENTS IN LEE COUNTY, ALABAMA. 9th Ann. Meeting, SE. Assn. Game & Fish Comm'rs. 1-13 p., map, proc. Oct. 1955.
Summary: "Studies on eight sample areas of small impoundments, swamps, and creeks in Lee County, Alabama between October, 1953 and January, 1955, indicated a relative abundance of the more important waterfowl as follows: (1) ring-necked duck, (2) mallard, (3) wood duck, (4) coot, (5) scaup. The ducks in general showed a fall migration peak during the first half of November in 1953 and in the

BIRDS--WATERFOWL--Continued

latter part of the month in 1954. Several species of ducks exhibited a definite habitat preference. On small impoundments ring-necked ducks predominated, on creeks mallards were most abundant and on a beaver swamp wood ducks out-numbered all others. Although 19 species of waterfowl were observed on the areas, only the wood duck was a summer resident. Five broods, four of which probably hatched between April 1 and May 7 were observed. It was concluded that the first and most important step in future waterfowl management in central Alabama would be improving the quality of existing wetlands. The present as well as the future role of creeks, small impoundments, and beaver swamps in waterfowl management is discussed.

Swift, Ernest. (4607 Conn. Ave., N.W., Wash. 8, D. C.) SOCIAL SECURITY FOR MR. DUCK. Trans. 20th N. A. Wildl. Conf. p. 109-117. 1955.

Our solicitude for waterfowl is selfish--we save them so we can have more hunting. We have a legal as well as a moral obligation to the American people to perpetuate the resource. Great sums of money have already been spent to benefit waterfowl. The people look to us, the professional conservationists, for leadership. We are fast approaching a crisis in the preservation of this national resource, and we must re-evaluate our responsibilities. To preserve ducks, we must preserve their habitat. The Number One job is land purchase--saving of wetlands is a prerequisite for giving waterfowl food and living space. Second, we must publicize our objectives--tell the story as effectively as our competitors in land use. Third, coordination of efforts by everyone towards preservation on a continental basis is vitally important.--W. Deering.

Webster, Clark G. (Patuxent Refuge, Laurel, Md.) SELECTED REFERENCES ON CONTROLLED SHOOTING AND ARTIFICIAL PROPAGATION OF WILD DUCKS. US F&WS, Wildl. Leafl. 371. 1-3 p. Nov. 1955.

Annotated and classified list of 21 titles, chiefly on propagation.

BIRDS--CRANES, RAILS, SHOREBIRDS

Kalela, Olavi. (U. Helsinki, Finland.) DIE NEUZEITLICHE AUSBREITUNG DES KIEBITZES, VANELLUS VANELLUS (L.), IN FINNLAND. Ann. Zool. Soc. 'Vanamo' (Helsinki) 16(11). ii + 80 p., 16 figs. 1955.

In German with English summary. The lapwing, a plover-like bird of great economic importance, has widely extended its range in Finland since 1890. Kalela charts range changes in detail, describes breeding habitats, and analyzes factors that may have affected the range expansion. The lapwing breeds in meadows and cultivated land. It prefers fertile lands and lands near lakes and coasts. After considering and discarding other possible explanations, the author concludes that range changes resulted from milder springs. "In fact, the range extension coincides with a period characterized by rapidly rising spring temperatures... The Lapwing populations are influenced by the milder springs in several ways, largely via feeding conditions. Their increase seems to be due, above all, to the summative effect of the following four factors: 1. decreased mortality in the end phases of the migration period; 2. increased immigration as a consequence of extended migration; 3. increased number of birds starting to breed, and 4. decreased numbers of females which, having lost their first clutches, stop breeding. The range extension is a secondary effect of the increase in the population... However, spread into new areas is in part due to prolonged migration in spring not connected with territorial behavior."

Richter, Wilmer C., and Stephen A. Liscinsky. (Pa. Game Comm.) TECHNIQUE FOR IDENTIFICATION OF WOODCOCKS AT NIGHT. J. Wildl. Mgt. 19(4): 501. Oct. 1955.

Describes method for identifying individuals at night by means of reflective leg bands of different colors.--Authors.

OTHER BIRDS

Cunningham, John D. (U. Calif., L. A.) NOTES ON FOOD HABITS OF THE WHITE-TAILED KITE IN SOUTHERN CALIFORNIA. Condor 57(6): 371. Nov.-Dec. 1955.
Based on examination of pellets and other food remains. Food of the pair of kites studied consisted almost entirely of small mammals, especially Mus, Microtus, and Reithrodontomys.

Greenewalt, Crawford H., and Frank Morton Jones. PHOTOGRAPHIC STUDIES OF THE FEEDING OF NESTLING HOUSE WRENS. Am. Sci. 43(4): 541-549, illus. Oct. 1955.
Electronic flash made possible sharp photographs of parent birds bringing insects to young. Insects and the like usually were identifiable to major group, sometimes to genus or species, from photos. Equipment is described, sample photos are reproduced, and recorded foods of the wrens are tabulated.

Lockie, J. D. (Nature Conservancy, Edinburgh, Scot.) THE BREEDING HABITS AND FOOD OF SHORT-EARED OWLS AFTER A VOLE PLAGUE. Bird Study 2(2): 53-69, 3 figs. 1955.
Summary: "The breeding and feeding of Short-eared Owls during and after a decline in the numbers of their principal prey, the Short-tailed Vole, are described. The owls were strongly territorial. Hunting was done within the territory. Predation on owls by foxes and crows was heavy in 1954. The amount eaten by adult and young owls was measured and an attempt made to estimate the proportion of voles taken by owls. While the estimates are very rough, it seems possible that owls and other predators hastened the decline in the numbers of voles early in the spring when ground cover was low and the voles were not breeding. However, the failure of the voles to increase later in the summer, when they were producing young, is likely to have been due to factors other than predation."

Lunk, William Allan. THE ROUGH-WINGED SWALLOW: A COMPARATIVE STUDY BASED ON ITS BREEDING BIOLOGY IN SOUTHERN MICHIGAN. Ph. D. thesis, U. Mich. 417 p. 1955. [From long abstract in Dissertation Abstracts 15(9).]

Tuck, Leslie M., and H. J. Squires. (Can. Wildl. Serv., St. John's, Nfld.) FOOD AND FEEDING HABITS OF BRÜNNICH'S MURRE (URIA LOMVIA LOMVIA) ON AKPATOK ISLAND. J. Fish. Res. Bd. Canada 12(5): 781-792, illus. 1955.
Feeding habits, foods of adults and young, food utilization of young, estimated fish consumption of the murre colony. The island is in Ungava Bay, n. Quebec.

Weller, Milton W., I. C. Adams, Jr., and B. J. Rose. (U. Mo.) WINTER ROOSTS OF MARSH HAWKS AND SHORT-EARED OWLS IN CENTRAL MISSOURI. Wilson Bul. 67(3): 189-193. Sept. 1955.
Account of roosting behavior and detailed report on food habits as shown by pellet contents.

REPTILES AND AMPHIBIANS

Blair, W. Frank. (U. Tex.) SIZE DIFFERENCE AS A POSSIBLE ISOLATION MECHANISM IN MICROHYLA. Am. Nat. 89(848): 297-301, graphs. Sept.-Oct. 1955.

Brattstrom, Bayard H. (Calif. Inst. Tech.) NOTES ON THE HERPETOLOGY OF THE REVILLAGIGEDO ISLANDS, MEXICO. Am. Midl. Nat. 54(1): 219-229, map. July 1955.
This list, with field notes on the biology of the herpetofauna, includes some good data on territorial behavior of Urosaurus clarionensis and information on temperature tolerances of several species of reptiles.

REPTILES AND AMPHIBIANS--Continued

Bullock, Theodore Holmes. (U. Calif., Los Angeles.) COMPENSATION FOR TEMPERATURE IN THE METABOLISM AND ACTIVITY OF POIKILOTHERMS. Biol. Rev. 30(3): 311-342, graphs. Aug. 1955.
"It is the purpose of this article to call attention to evidence, old and new, supporting the thesis that many cold-blooded animals are...relatively independent of temperature, within limits, in nature. This is to say that these species tend to maintain a certain level of metabolism and other characters measured as rates, compensating for different temperatures by homoeostatic mechanisms of various kinds."

Carr, Archie. (U. Fla.) THE RIDDLE OF THE RIDLEY. Animal Kingdom 58(5): 146-156, illus. Sept.-Oct. 1955.
In whimsical and literary yet factual fashion, Carr brings together what he and others have found out about the Atlantic ridley (Lepidochelys) and dwells on the mystery of the reproduction and breeding area of this sea turtle. Even the geographic range of this turtle is puzzling.

Carriker, M. R., A. N. Lentz, and J. R. Westman. BIBLIOGRAPHY ON SNAKES, LIZARDS, TURTLES, FROGS, AND SALAMANDERS OF NEW JERSEY. Rutgers U. (New Brunswick, N. J.), Leafl. no. 127. 8 p., illus. 1955. [From J. Forestry 53(11).]

Gosner, Kenneth L., and Irving H. Black. (Newark Mus., Newark, N. J.) THE EFFECTS OF TEMPERATURE AND MOISTURE ON THE REPRODUCTIVE CYCLE OF SCAPHIOPUS H. HOLBROOKI. Am. Midl. Nat. 54(1): 192-203, graphs. July 1955.
Significant paper on weather conditions that stimulate breeding, relationship between temperature and mortality and growth of embryos and larvae, and probable cause and effects of breeding habits of Scaphiopus.

Guibé, Jean, and Saint-Girons, H. (Mus. Natl., Paris, and Bohallard, Puceul, Loire-Inferieure, France.) ESPACE VITAL ET TERRITOIRE CHEZ LES REPTILES. La Nature no. 3245: 358-362, illus. Sept. 1955.
A review of the literature dealing with behavior of reptiles and its interpretation. The authors believe that reptiles can be said to have home ranges but not territories. Combat between individuals is interpreted as sexual fighting, usually not related to defense of area; the spacing of individuals which sometimes results from such fighting is considered a secondary effect and not true intraspecific intolerance, which the authors consider basic to territorial behavior.--L. F. Stickel.

Legler, John M. (Mus. Nat. Hist., U. Kans.) OBSERVATIONS ON THE SEXUAL BEHAVIOR OF CAPTIVE TURTLES. Lloydia 18(2): 95-99. June 1955.
Courtship and mating in Chelydra serpentina and Trionyx spp.

Logier, E. B. S., and G. C. Toner. (Roy. Ont. Mus.) CHECK-LIST OF THE AMPHIBIANS AND REPTILES OF CANADA AND ALASKA. Contrib. Roy. Ont. Mus. Zool. & Paleon. no. 41. v + 88 p., maps. Aug. 1955. $2.00.
This useful and welcome work, the fruit of many years of effort, does not merely state names and ranges; it has a spot map for each species and lists all important localities, with indication of basis of each record. A bibliography of 13 pages completes the publication. Canadian ranges have been poorly handled in U. S. herpetofaunal works; this book should do much to correct the situation. The authors' decision to cover Alaska as well as Canada seems decidedly well advised--biologically natural.

Martof, Bernard. (U. Ga.) SOME RECORDS OF REPTILES OF GEORGIA. Copeia 1955(4): 302-305. Nov. 1955.
Taxonomic status and measurements of 3 sp. collected in n. Ga. in areas of intergradation: coalskink (Eumeces anthracinus), ringneck snake (Diadophis punctatus), and milksnake (Lampropeltis doliata). Also Ga. records for Haldea valeriae.--L. F. Stickel.

REPTILES AND AMPHIBIANS--Continued

Moore, J. E., and E. H. Strickland. (U. Alberta, Edmonton.) FURTHER NOTES ON THE FOOD OF ALBERTA AMPHIBIANS. Am. Midl. Nat. 54(1): 253-256. July 1955.
Thorough report on stomach contents of 36 Rana sylvatica, 12 R. pretiosa, 9 Bufo boreas, and 6 Ambystoma tigrinum.

Parmalee, Paul W. (Ill. St. Mus.) REPTILES OF ILLINOIS. Ill. St. Mus. (Springfield), Popular Sci. Ser. vol. 5. 1-88 p., illus. 1955. 50¢.
A strictly popular guide that has a photograph, very brief indication of instate distribution, general description, and general account of natural history for each species. Appended are short sections on collecting, preserving, and caring for captives.

Pope, Clifford H. THE REPTILE WORLD / A NATURAL HISTORY OF THE SNAKES, LIZARDS, TURTLES, AND CROCODILIANS. Alfred A. Knopf, N. Y. xxv + 325 + xiii p., 222 figs. 1955. $7.50.
A useful, authoritative, popular account of reptiles of the world. A library that has any demand at all for reptile books should include this volume, for it is readable by anyone from high-school age on up, it will be used frequently for quick reference by professional naturalists, and it is illustrated by 222 large, excellent photographs. The author, a distinguished herpetologist, has virtually omitted tiresome descriptive matter and has concentrated on habits and natural history. He has gathered his material from a tremendous range of scientific literature and he has presented it as simply as possible. Each major group (such as crocodilians or turtles) is introduced by a series of valuable sections on origin, age, size, growth, hibernation, defense, reproduction, economic importance, distribution, and the like. These sections are, in the reviewer's opinion, the best parts of the book. Crocodilians and sea turtles are discussed species by species, but most groups have too many species for this. The species-rich groups are discussed by families or subfamilies, with important, interesting, or well-known genera or species given special mention. North American animals are given more attention than most, but even here many genera could not be included. Throughout the book the author's interest in habits and adaptations is apparent, and it is from this and its up-to-dateness that the book derives much of its interest; in contrast to certain other writers about reptiles, Pope deliberately plays down the sensational aspects of his subject.

Saint-Girons, Hubert. (Bohallard, Puceul, Loire-Inferieure, France.) ÉCOLOGIE ET ÉTHOLOGIE DES VIPERES DE FRANCE. Ann. des Sci. Nat., Zool., 11e série, 14: 263-343, illus. 1952.
Results of field and laboratory studies over a period of years. Topics include geographic distribution, general biology, ecology, population dynamics, and behavior. The latter includes observations on home ranges and density of a local population as well as experiments with overpopulation, homing, orientation (apparently largely visual), and memory. Classified bibliography of 9 pages.--L. F. Stickel. [Saint-Girons is interested in exchanging reprints on natural history, ecology, and behavior of reptiles.]

Saint-Girons, H. (Bohallard, Puceul, Loire-Inferieure, France.) LE CYCLE D'ACTIVITÉ ET SES FACTEURS CHEZ VIPERA LATASTEI BOSCA. Vie et Milieu 5(4): 513-528, illus. 1954. [June 1955.]
Activity of vipers kept in outdoor terraria over a 14-month period is related to external factors, particularly temperature variations.--L. F. Stickel.

Savage, Jay Mathers. THE LIZARD FAMILY XANTUSIIDAE: AN EVOLUTIONARY STUDY. Ph. D. thesis, Stanford U. 218 p. 1955. [From long abstract in Dissertation Abstracts 15(10).]
Morphology, taxonomy, relationships. Ecology and natural history are reviewed.

Schwartz, Albert. (Charleston Mus., S. C.) THE DIAMONDBACK TERRAPINS (MALACLEMYS TERRAPIN) OF PENINSULAR FLORIDA. Proc. Biol. Soc. Wash. 68: 157-164. Oct. 1955.
Study of taxonomy and variation, with description of new race.

REPTILES AND AMPHIBIANS--Continued

Twitty, Victor C. (Stanford U.) FIELD EXPERIMENTS ON THE BIOLOGY AND GENETIC RELATIONSHIPS OF THE CALIFORNIAN SPECIES OF TRITURUS. J. Exp. Zool. 129(1): 129-147, illus. June 1955.
Numerous artificially produced hybrids were released in nature and their future will be followed. A number of adult ♂♂ were marked by amputation and released to study movements; so far, it seems they return to the same part of the stream where released. Experiments on how ♂♂ find ♀♀ in water demonstrated that the attraction is purely chemical.

Volpe, E. Peter. (Newcomb Coll. of Tulane U.) INTENSITY OF REPRODUCTIVE ISOLATION BETWEEN SYMPATRIC AND ALLOPATRIC POPULATIONS OF BUFO AMERICANUS AND BUFO FOWLERI. Am. Nat. 89(848): 303-317, map & graphs. Sept.-Oct. 1955.

Webb, Robert G., and A. I. Ortenburger. (U. Kans.) REPTILES OF THE WICHITA MOUNTAINS WILDLIFE REFUGE, COMANCHE COUNTY, OKLAHOMA. Proc. Okla. Acad. Sci. 34: 87-92. 1953.
Annotated list for the whole county, but with special reference to the refuge.

Zweifel, Richard G., and Kenneth S. Norris. (MVZ, U. Calif., Berkeley.) CONTRIBUTION TO THE HERPETOLOGY OF SONORA, MEXICO: DESCRIPTIONS OF NEW SUBSPECIES OF SNAKES (MICRUROIDES EURYXANTHUS AND LAMPROPELTIS GETULUS) AND MISCELLANEOUS COLLECTING NOTES. Am. Midl. Nat. 54(1): 230-249, illus. July 1955.
Annotated list with comments on taxonomy and biology of numerous forms. Includes what is probably the first good spot map for range of Micruroides. [Now the only venomous U. S. snake for which there is no adequate map is Micrurus fulvius.]

INVERTEBRATES

Brown, Paul Lopez. THE BIOLOGY OF THE CRAYFISHES OF CENTRAL AND SOUTHEASTERN ILLINOIS. Ph. D. thesis, U. Ill. 165 p. 1955. [From long abstract in Dissertation Abstracts 15(10).]
Includes taxonomy, with keys for identification. Chiefly on ecology and natural history.

VEGETATION--FLORAS AND COMMUNITIES

Bailey, Virginia Long, and Harold Edwards Bailey. (Wayne U.) A GUIDE TO THE FLOWERING PLANTS AND FERNS OF THE WESTERN NATIONAL PARKS. Am. Midl. Nat. 54(1): 1-32, map. July 1955.
First part of what eventually will be a volume. This part covers ferns and conifers. Text consists of good, concise keys with indications of distribution. Parks covered are all of those in U. S. west of Great Plains and in Alaska. Lacking descriptions, illustrations, and range statements, the paper is very compact. It should be extremely useful and handy for naturalists visiting national parks.

Buell, Murray F., and F. H. Bormann. (Rutgers U.) DECIDUOUS FORESTS OF PONEMAH POINT, RED LAKE INDIAN RESERVATION, MINNESOTA. Ecol. 36(4): 646-658, illus. Oct. 1955.
Ecological analysis.

Churchill, Ethan D. (1500 38th St. SE, Wash., D. C.) PHYTOSOCIOLOGICAL AND ENVIRONMENTAL CHARACTERISTICS OF SOME PLANT COMMUNITIES IN THE UMIAT REGION OF ALASKA. Ecol. 36(4): 606-627, illus. Oct. 1955.
Descriptive and quantitative study.

Evans, Francis C., and Eilif Dahl. (U. Mich.) THE VEGETATIONAL STRUCTURE OF AN ABANDONED FIELD IN SOUTHEASTERN MICHIGAN AND ITS RELATION TO ENVIRONMENTAL FACTORS. Ecol. 36(4): 685-706, illus. Oct. 1955.
Detailed description and interpretation, with comments on methodology.

VEGETATION--FLORAS AND COMMUNITIES--Continued

Fell, Egbert W. FLORA OF WINNEBAGO COUNTY, ILLINOIS / AN ANNOTATED LIST OF THE VASCULAR PLANTS. Nature Conservancy (4200 22d St. NE., Wash. 18, D. C.). vi + 207 p., illus. Map in endpocket. 1955. $2.75, paper; $3.50, cloth.
Winnebago Co. is at the center of the n. boundary of Ill. Originally it had a mixture of prairie and woodland. Good samples of woodland remain and a few patches of prairie still exist. The author is thoroughly familiar with the county and its vegetation. He has, with the aid of several collaborators, prepared a valuable county flora. The first 28 pages discuss the habitats, history, and natural areas of the county and the derivation of its flora. 122 pages are devoted to the annotated list. Both scientific and common names are given. Annotations pertain mainly to habitats, localities, and relative abundance, but some descriptive and taxonomic comments are made. There are 36 pages of illustrations, including several habitat photos and numerous plant drawings by author. A good index completes the volume.

Holt, Vesta. (Chico St. Coll.) KEY TO WILD FLOWERS, FERNS, TREES AND SHRUBS OF NORTHERN CALIFORNIA. National Press, Palo Alto, Calif. 182 p. 1955. $3.00. [From Nat. Mag. 48(8).]
"In this loose-leaf field book the author...provides a good key and field guide to the region roughly from the Sutter Buttes north to the Oregon line and from the inner coast ranges east to the Nevada line. In order to use the keys it is necessary to know the family to which a flower belongs. The key is written for the layman..."

Linsdale, Jean M. (Jamesburg Route, Carmel Valley, Calif.) CHECK LIST OF FERNS AND SEED PLANTS OF FRANCES SIMES HASTINGS NATURAL HISTORY RESERVATION. Leaflets of Western Botany 7(9): 201-218. Feb. 1955.
Scientific and common names of 586 species.

Lynch, Brother Daniel. (St. Edward's U., Austin, Tex.) ECOLOGY OF THE ASPEN GROVELAND IN GLACIER COUNTY, MONTANA. Ecol. Monog. 25(4): 321-344, illus. Oct. 1955.
Good descriptive and interpretive study of an area on the w. edge of the Great Plains where aspen groves are mixed with prairie.

McCormick, Jack Sovern. A VEGETATION INVENTORY OF TWO WATERSHEDS IN THE NEW JERSEY PINE BARRENS. Ph. D. thesis, Rutgers U. 133 p. 1955. [From long abstract in Dissertation Abstracts 15(10).]

Shaver, Jesse M. FERNS OF TENNESSEE. Geo. Peabody Coll. for Teachers, Nashville, Tenn. xvii + 502 p., illus. + plates. 1954. $6.00. [From review by C. V. Morton, Sci. Monthly 81(6).]
Of all our state fern books, "It is not only the longest, most elaborate, and most beautiful but also one of the most scientific and accurate. Fifty-six species are treated, with about nine pages of text and four or five illustrations for each species." Illustrations include drawings, photographs, and distribution maps. Fern allies are not included in this book.

VEGETATION--TREES

Forbes, Reginald D., ed. FORESTRY HANDBOOK. Ronald Press Co. (15 E. 26th St., N. Y. 10, N. Y.) 1220 p., 744 illus. 1955. $15.00. [From A.I.B.S. Bul. 5(5).]
"...should immediately take its place on the scientific reference shelf with the Handbook of Chemistry and Physics. To the thousands of persons engaged in forestry and forest products industries, this book is a must. It contains the working methods and techniques, formulas, tables, converting factors and related data most commonly used. In addition, information about watershed management, forest recreation, wildlife management and forest range management is supplied. Six years in preparation, an editorial board of 145 supplied guidance and material to the Society of American Foresters, under whose auspices the Handbook was prepared."

VEGETATION--TREES--Continued

Kaufert, Frank H., and William H. Cummings. FORESTRY AND RELATED RESEARCH IN NORTH AMERICA. Soc. Am. Foresters (Hills Bldg., Wash. 6, D. C.). 280 p. 1955. $5.00. [From review in Outdoors News Bul. 9(21).]
An authoritative report. "The book deals not only with timber resources, its products and utilization, but included also are those parts of wildlife, range, watershed, and recreation and activities having their basis on forest lands. The text surveys the progress of research during the past twenty-five years, and recommends goals during the next quarter century. Each phase of the research effort is discussed fully under a subject matter section, fifteen in all. The report is divided into three parts, forestry and related research in the United States, Canada, and Mexico. Described in detail are the agencies and institutions conducting research, their expenditures for research, the training of research workers, and the problems requiring research."

Sternitzke, Herbert S. (So. For. Exp. Sta., New Orleans 13, La.) TENNESSEE'S TIMBER ECONOMY. US Dept. Agr., For. Resource Rep. no. 9. iii + 56 p., illus. + large folding map. 1955. 55¢ from Superintendent of Documents.
Useful and well prepared account of present timber conditions in different regions of state, the various timber industries, current utilization, and management needs. Good maps show physiographic regions and forest types of Tenn.

VEGETATION--PASTURE AND RANGE

Poulton, Charles Edgar. ECOLOGY OF THE NON-FORESTED VEGETATION IN UMATILLA AND MORROW COUNTIES, OREGON. Ph. D. thesis, St. Coll. Wash. 177 p. 1955. [From long abstract in Dissertation Abstracts 15(10).]

Ralston, Furman Paul, Jr. THE EFFECTS OF MOWING ON THE VEGETATION OF CERTAIN PRAIRIE AREAS IN MANHATTAN, KANSAS. Ph. D. thesis, Kans. St. Coll. 90 p. 1955. [From long abstract in Dissertation Abstracts 15(10).]

Sharp, L. A. (U. Idaho.) SUGGESTED PROCEDURE FOR USE WITH THE LOOP TRANSECT METHOD. U. Idaho, For., Wildl. & Range Exp. Sta., Res. Note no. 12. 6 + 3 p., mimeo. + 6 figs. May 1955.
Instructions for use of improved version of this range analysis method.

Stoddart, Laurence A., and Arthur D. Smith. (Utah St. Agr. Coll.) RANGE MANAGEMENT. 2d ed. McGraw-Hill, N. Y. 433 p., 156 figs. 1955. $7.00.
New edition of an important text and reference. Several sections are entirely new, others are much reduced from the 1943 first edition. Chapter 8 deals with "Relationships of Native Fauna to Ranges and Range Use."--Neil Hotchkiss.

Various authors. ARID ZONE RESEARCH--V / PLANT ECOLOGY / PROCEEDINGS OF THE MONTPELLIER SYMPOSIUM. UNESCO, 19 Ave. Kleber, Paris 16e, France. 1-124 p., illus. 1955. $3.00 from Columbia U. Press, N. Y. 27, N. Y.
Nineteen short papers by experts from many countries take up such topics as the following: characteristics of arid zone vegetation in various lands; ecological problems in proper land use; classification of climatic and vegetative types; ecological factors determining types of vegetation present; forest ecology in arid regions; relation of soils to vegetation; trace element nutrition of plants; chlorosis in dry-land crops; microbiology of soils; how land-use surveys are made in Australia; insect populations in relation to vegetation in moving sands; and effects of drought and overgrazing on rangelands. The papers help give broad background and many worthwhile thoughts. They are all relatively easy to read. Some are in English with French summary, others are the reverse.

VEGETATION--PASTURE AND RANGE--Continued

Various authors. ARID ZONE RESEARCH--VI / PLANT ECOLOGY / REVIEWS OF RESEARCH. UNESCO, 19 Ave. Kléber, Paris 16e, France. 1-377 p., illus., endpocket maps. 1955. $7.00 from Columbia U. Press, N. Y. 27, N. Y.

Ten of the world's leaders in the field here provide the finest and best documented review of ecological knowledge of arid and semi-arid lands that has yet appeared. Each expert discusses a section of the world with which he is especially familiar. Climates, soils, vegetation types, successions, changing conditions, economic management (past, present, and recommended), research and management needs, effects of grazing, effects of fire, and useful native plants that merit economic attention are all considered, usually in as much detail as knowledge permits. Large numbers of references are cited for each paper. The paper by W. G. McGinnies on the U. S. and Canada runs 50 pages; 600 references are cited. Articles in this volume are serious and serviceably technical but they are written with a minimum of technical terminology and should be fairly easy reading for any educated person.

VEGETATION--WET-LAND

Matsumura, Y., and H. D. Harrington. THE TRUE AQUATIC VASCULAR PLANTS OF COLORADO. Colo. Agr. Exp. Sta. (Ft. Collins), Tech. Bul. 57. 130 p., illus. Mar. 1955.

Fifty-one species are keyed, described, and illustrated with very good drawings.--Neil Hotchkiss.

GENERAL CONSERVATION, WATER, AND CLIMATE

Flint, Richard Foster. PLEISTOCENE GEOLOGY OF EASTERN SOUTH DAKOTA. US Geol. Surv., Prof. Paper 262. 173 p., illus. 1955. $3 from Supt. of Documents.

On either side of the James River lowland, 2 plateau-like areas extend north and south nearly across e. S. Dak. In these highlands, thick glacial drift is responsible for much internal drainage, which results in potholes, marshes, and lakes. Accounts of topography, drainage, and soils describe part of the environment in this highly productive duck, muskrat, and pheasant country.--Neil Hotchkiss.

Raushenbush, Stephen. (Pub. Affairs Inst., Wash., D. C.) DO RESOURCE PROGRAMS MEET PEOPLE'S NEEDS? Trans. 20th N. A. Wildl. Conf. p. 91-99. 1955.

Correlations between prolonged visits to national parks and forests and personal disposable income allow a projection of a low demand for recreational outdoor activities of 36% over 1953 in 1960 and 70% over 1953 in 1965. Increased productivity and the entrance of "war babies" into the labor force indicate a potential additional 5 weeks of vacation by 1965. The demand on recreational facilities and wildlife resources will probably be of a different order of magnitude than any yet experienced. Conservationists should be developing a new outdoor recreation program to match this probable demand.--S. Raushenbush.

Vogt, William. (501 Madison Ave., N. Y. 22, N. Y.) FUTURE POPULATION DEMANDS. Trans. 20th N. A. Wildl. Conf. p. 82-90. 1955.

The world's population is increasing at an unprecedently rapid rate; at current rate of increase, we shall double in 40 years. Overpopulation is creating the need for huge expenditures of money for foreign areas which cannot cope with the increased demands. Ultimately, these subsidies will cause a drop in our living standards and population increase in the U. S. will destroy wild life and associated intangibles that have been a precious part of our inheritance.--Wm. Vogt.

GENERAL CONSERVATION, WATER, AND CLIMATE--Continued

Wooten, Hugh H., and James R. Anderson. AGRICULTURAL LAND RESOURCES IN THE UNITED STATES WITH SPECIAL REFERENCE TO PRESENT AND POTENTIAL CROPLAND AND PASTURE. US Dept. Agr., Agr. Inf. Bul. no. 140. ii + 107 p., 8 figs., 34 tables. June 1955.

A projection to 1975 of development of new land, shifts of pasture to cropland, increases in improved pasture, increases in irrigation and drainage, etc. Total cropland is expected to rise 6%, or 30 million acres. Total grazing lands may decline by 3%, but more of the grazing land will be improved. Less forest grazing is expected. On the whole, the trend toward intensified use of more of our land is clear. The authors give some consideration to conservation of soil and water, but a quick glance through the paper revealed no mention of refuge, park, recreational, or natural-area lands or their values or probable trends.

SOILS

Brackeen, L. G., and others. SOIL SURVEY OF ELMORE COUNTY, ALABAMA. US Soil Cons. Serv., Ser. 1939, no. 26. 1-116 p., illus. + large folding maps. Sept. 1955. $3.50 from Superintendent of Documents.

Cline, M. G., and others. SOIL SURVEY OF THE TERRITORY OF HAWAII / ISLANDS OF HAWAII, KAUAI, LANAI, MAUI, MOLOKAI, AND OAHU. US Soil Cons. Serv., Soil Surv. Ser. 1939, no. 25. xix + 644 + 20 plates + 27 large folding maps. Sept. 1955. $6.25 from Superintendent of Documents.

A major reference with many large, colored maps. Text sections by specialists take up climate, water supply, vegetation, land utilization, people and their businesses and facilities. These sections occupy the first 63 pages. Rest of text is devoted to soils and agriculture.

Knobel, E. W., and others. SOIL SURVEY OF THE GRAND JUNCTION AREA, COLORADO. US Soil Cons. Serv., Ser. 1940, no. 19. 1-118 p., illus. + large folding maps. Nov. 1955. $2.00 from Superintendent of Documents.

Area covered is part of the Grand Valley in central part of Mesa Co.

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